Farm Chemicals

Pioneer Journal of the Industry

...mbia Bay Plant 50

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MAR 20 1956

Vol. 119 No. 3 MARCH 1956 50 Cents

NOW IS THE TIME TO avoid ammoniation bottlenecks!

Arcadian®

PRODUCTS FOR PROFITABLE FARMING

Nitrogen Solutions
(Nitrana®, Urana® and U-A-S*)
Anhydrous and Aqua Ammonia
American Nitrate of Soda
A-N-L® Nitrogen Fertilizer
Urea Products
Sulphate of Ammonia

*Trade-mark

Don't let ammoniation and curing bottlenecks slow your output or reduce your quality during the rush to mix goods for the spring season. See Nitrogen Division for the right Nitrogen Solutions to fit every fertilizer mixing job in your plant production system.

Right now, as in the past, Nitrogen Division has the broadest line of Nitrogen Solutions available for mixed goods manufacturers. ARCADIAN NITRANA®, URANA® and U-A-S* Solutions provide a wide range of economical sources of nitrate, ammonia and urea nitrogen that also serve as excellent curing media. Ask a Nitrogen Division technical service representative about the ARCADIAN Solutions best suited to your plant conditions. His help in breaking bottlenecks is available at no cost to Nitrogen Division customers.

NITROGEN DIVISION Allied Chemical & Dye Corporation

New York 6, N. Y. • Hopewell, Va. • Ironton, Ohio • Omaha 7, Neb.
Indianapolis 20, Ind. • Columbia, Mo • Kalamazoo, Mich. • St. Paul 4, Minn.
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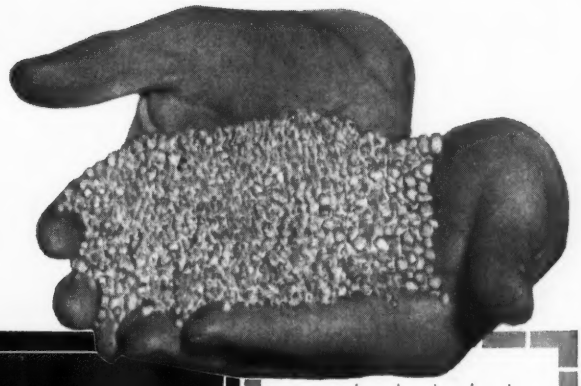
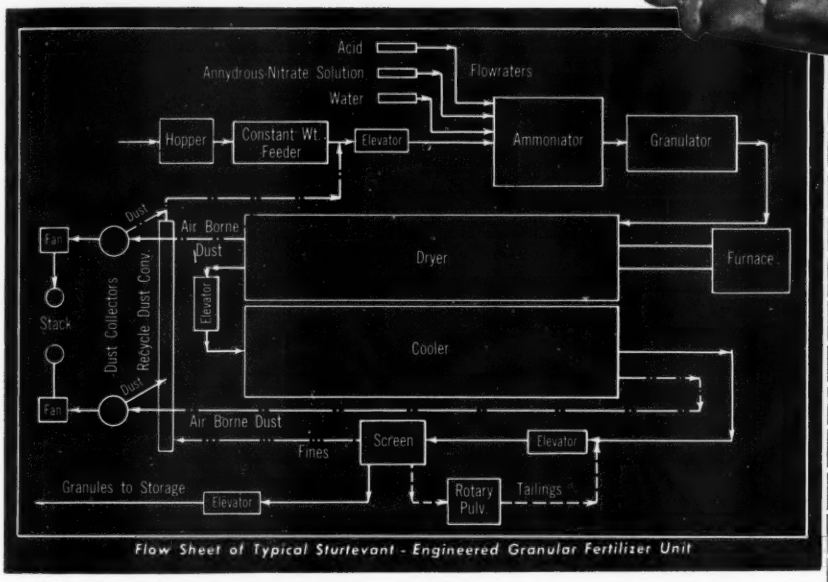
NITROGEN DIVISION ALLIED CHEMICAL

Granular Fertilizer Can Be in Your Future, too!





Flow Sheet of Typical Sturtevant - Engineered Granular Fertilizer Unit

LET STURTEVANT ENGINEERING AND EQUIPMENT MAKE THIS YOUR GRANULAR FERTILIZER UNIT

If you operate a mixing plant, there's a granulator in your future. The signs are unmistakable. Granular fertilizer is replacing its powdered cousin faster than modern processors can keep up with the demand.

Take the case of Canada Packers, Limited, of St. John, New Brunswick. Fourteen months after Sturtevant engineers assisted in adapting this customer's plant to a granular product, the balance of orders had shifted to 70% granular against 30% powder — *and management expects in a very short time (perhaps as you read this) that shipments will be 100% granular.*

Of course, we at Sturtevant Mill Co. are not market authorities, although we do believe this experience by Canada Packers, Limited is significant.

Our business is to assist you with the designing and engineering of the best possible granular fertilizer unit for your needs — also super phosphate units and conventional mixing units, according to your requirements.

Serving the fertilizer industry has been our business since 1873 . . . which is why you won't get rash promises or rush engineering when you come to Sturtevant. You will get a unit that will produce *what* it's supposed to *when* it's supposed to.

Why not let Sturtevant help you to spell out *your* future in granular fertilizers by writing today? Use the convenient coupon on the right.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to *lower* operating costs over *more* years

PULVERIZERS • CRUSHERS • MICRON-GRINDERS • GRANULATORS • SEPARATORS
SCREENS • MIXERS • FEEDERS • ELEVATORS • CONVEYORS
MECHANICAL DEN & EXCAVATORS

STURTEVANT MILL COMPANY, 140 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Granulators ☐
Also bulletins on Sturtevant machines for:

☐ CRUSHING ☐ GRINDING ☐ PULVERIZING
☐ MICRON-GRINDING ☐ SEPARATING ☐ MIXING
☐ SCREENING ☐ FEEDING
☐ MECHANICAL DEN & EXCAVATORS ☐ ELEVATING & CONVEYING

I am interested in a new unit ☐ conversion ☐

Desired capacity is_____

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

Farm Chemicals

MARCH, 1956
No. 3
Vol. 119

Pioneer Journal of Farm Chemicals Industry, Est. 1894

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In this issue . . .

February's big event in the fertilizer trade was dedication of the new Escambia Bay Chemical Corp. nitrogen plant near Pensacola, Fla. Producing NH_3, ammonium nitrate solutions and pebbled ammonium nitrate, sold exclusively through Ashcraft-Wilkinson, it will aid SE fertilizer manufacturers improve their services. See page 50 for a description of the plant.

Heading the parade of speakers at NAC association's Hollywood Beach, Fla., meeting on March 14-16 will be Geo. D. Larrick, FDA commissioner, who will discuss the effects of F&D legislation on the nation's growers. Other speakers and subjects are noted on page 53.

Installation of a Sturtevant granulating unit at the St. John, N.B. plant of Canada Packers is reported highly successful. The factory will ship 70 per cent of this year's production in this form and, as noted on page 54, is looking to 100 per cent output.

Industrial weed control servicing utilities, railroads, manufacturers, highway departments, etc., is a market of increasing interest to the pesticide field. On page 57, DuPont's John Naylor discusses industrial applications of substituted urea herbicides.

On page 22, the U.S. Dept. of Labor shows the fertilizer industry Federal Wage-Hour Law compliance record to be an unenviable one. With the minimum wage now at $1.00/hr. the subject is of particular importance and, in April, a special article will cover points of the law with which you should be familiar.

Cover story

A new northern Florida landmark—the prilling tower at Escambia Bay Chemical Corp.'s plant. Here ammonium nitrate solution is prilled or pebbled, then collected, dried, screened and bagged for shipment as Ammo-Nite.

HERE'S THE LION LINE-UP OF QUALITY NITROGEN FERTILIZER MATERIALS

Lion Anhydrous Ammonia—82.2% nitrogen. Quality guaranteed.

Lion Aqua Ammonia—Ammonia content about 30%—other grades to suit your requirements.

Lion Ammonium Nitrate Fertilizer—Improved spherical pellets. Guaranteed 33.5% nitrogen.

Lion Nitrogen Fertilizer Solutions—Various types to suit your particular manufacturing needs.

Lion Sulphate of Ammonia—White, uniform, free flowing crystals. Guaranteed 21% nitrogen.

Now that the new fertilizer manufacturing season is in full swing, make sure you realize all the profits your plant can produce. *Where you buy* your raw materials can be vital and now, more than ever before, it pays to buy *your nitrogen needs* from Lion—a leader!

Lion nitrogen products are manufactured under rigid controls to meet exacting specifications—ending the costly production delays that result when ingredients vary in quality from day to day. With Lion products, you produce with maximum efficiency and profit—and you maintain the quality standards your customers demand.

Lion also provides an expert technical staff to assist you in solving difficult formulation and processing problems. And, throughout the year, Lion's sales building advertising tells farmers the plant food story—for your benefit. Lion's leadership in customer service stands out, offering you outstanding opportunities for increased profits—and your best season yet!

DISTRICT SALES OFFICES: LION OIL BUILDING, El Dorado, Ark. • INSURANCE EXCHANGE BUILDING, Des Moines, Ia. NATIONAL BANK OF COMMERCE BUILDING, New Orleans, La. • 1401 BUILDING, Atlanta, Ga.

LION OIL COMPANY

A DIVISION OF MONSANTO CHEMICAL COMPANY

EL DORADO, ARKANSAS

NEW BAUGHMAN

Compare Quality and Prices . . .

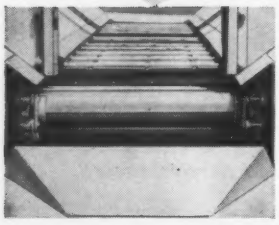
THE NEW *BAUGHMAN* K-5
LIME and FERTILIZER BODIES

MORE RUGGED BODY

- *Reinforced Top Edge*
- *Extended Jacks for full side support*
- *Internal Bracing*

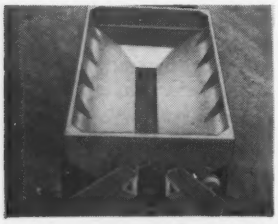
YOUR CHOICE OF 3 CONVEYORS
YOUR CHOICE OF 3 DRIVES
Each designed for a definite job
Ask for our recommendations

CONVEYORS



DRAG CHAIN CONVEYOR

20" wide. New, heavy duty —having two 20,000 lb. test malleable block chains, welded together with 4" spaced cross drags.



CHAIN BELT CONVEYOR

12" wide. Provides even flow of material to distributor. Links tend to break up small lumps, eliminating endgate plugging. Requires no shields, compartments or chokes. Positive sprocket drive.

BELT CONVEYOR

20" wide. Provides smooth even flow of material, even in smallest quantities. Double corrugated drum drives give more belt pull. Needs at least one compartment to ease load on belt. For dry material.

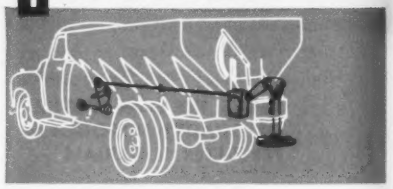
DRIVES

1 Power-take-off driven Distributor and Power-take-off driven Conveyor Drives direct to heavy 44-1 sealed gear case, mounted left or right, and by short #60 chain to distributor case. Has two speeds on conveyor and distributor. (High) for Lime; (Low) for Fertilizer. Has 1-3/16" drive shafts. All bearings sealed against fertilizer.

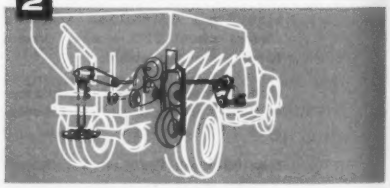
2 Power-take-off driven Distributor and Ground drive Conveyor. Drive can be mounted left or right. Has two speeds. (High) for lime and (Low) for fertilizer. Patented Baughman Ground drive Conveyor gives an even discharge of material in any gear or speed of travel. (Actually Ground Driven.) GC Models have SPREADING CHART showing accurate endgate settings for volume.

3 Hydraulic motor which drives Distributor is powered by hydraulic pump on power-take-off. Baughman Ground drive powers Conveyor.

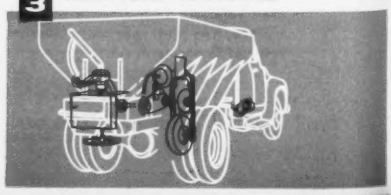
1 PD-PC DRIVE



2 PD-GC DRIVE



3 HD-GC DRIVE



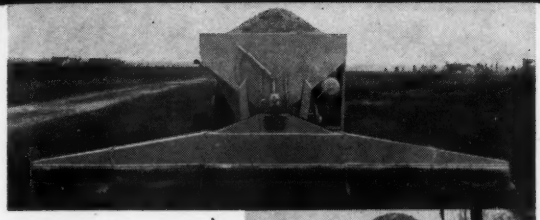
BAUGHMAN

BAUGHMAN

The pioneer and largest manufacturer by far of lime and fertilizer spreading equipment.

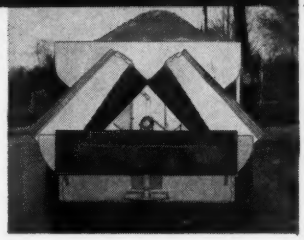
SPREADERS

WE HAVE NO COMPETITION!



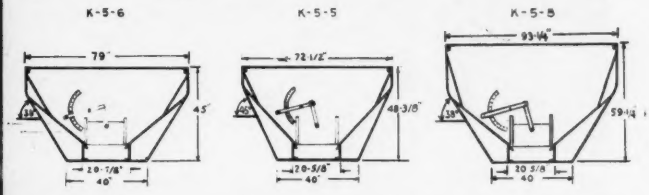
MODEL 235 ATTACHMENT SPREADER

(Optional) Holds material close to the ground. Photo shows open position (less than 8') for highway travel.

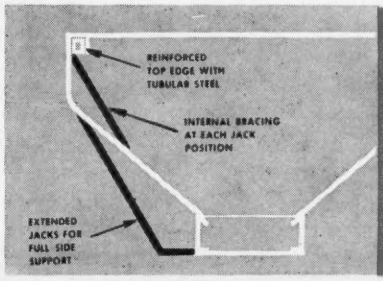


Rugged on top! Durable on the side! The rolled top edges are reinforced with 2" square tubular steel, protecting the body from denting by end loaders and shovels. Welded external jacks provide full-length reinforcement and support of body. Welded internal bracing in same positions provides full load strength under all operating conditions. Strongest body ever built!

Body styles and widths available in Chain Drag and Belt Conveyor Models.



Chain Belt Conveyor Models also available in three sizes with 12⅝" Endgate and 8" narrower body.



STRONGEST SPREADER BODY EVER BUILT!

CHECK THESE LOW PRICES!

EXAMPLES

10' MODEL K-5 CHAIN PD-PC Drive —	10' MODEL K-5 CHAIN PD-GC Drive —	10' MODEL K-5 CHAIN HF-GC Drive —
Power-take-off driven Distributor	Power-take-off driven Distributor	Hydraulic driven Distributor
Power-take-off driven Conveyor	Ground drive Conveyor	Ground drive Conveyor
Body Price $450.00	Body Price $450.00	Body Price.....$ 450.00
Drives 250.00	Drives 500.00	Drives 1050.00
TOTAL $700.00*	TOTAL $950.00*	TOTAL $1500.00*
235 Attachment 185.00	185.00	185.00

*Power-Take-Off, Freight, Mounting and Taxes to be added. Prices F.O.B., Jerseyville, Illinois.

Prices on Belt Chain and Belt Conveyors available on request. All models, except chain belt, available with single or double distributor.

Heavy Duty **BULKMOBILE**. Huge Capacity (740 Cu. Ft. Cap. shown here). Full hydraulic or gas engine operation with hydraulic conveyor. Ideal as "parent" body for feeding spreaders in the field. All sizes.

DEALERS WANTED IN SELECTED AREAS

For further details WRITE TO:

J. E. CADLE, Sales Manager
Baughman Manufacturing Co., Inc.
Jerseyville, Illinois

Manufacturing Co., Inc. JERSEYVILLE ILLINOIS

You'll see more Baughmans on the highway than all other makes!

EARLY IN 1931, to the cheers of townspeople, the United States Potash Company sent the first carloads of potash from Carlsbad, N. M., the then young center of the potash industry in the U. S.

It was an event of importance not only to the prosperity of New Mexico, but to the entire nation as well. Potash, as a vital component of the millions of tons of fertilizer used annually in agriculture and as a basic raw material for the chemical industry, has helped to build a richer America.

The Carlsbad area of New Mexico now produces almost 90% of the potash used in the nation. USP, which continues to build and expand with modern equipment and production methods, is proud to have been the pioneer developer of the great mineral resources of this area.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 60% K_2O MIN

REG. U. S. PAT. OFF.

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INCORPORATED
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Southern Sales Office
Rhodes-Haverty Building, Atlanta, Georgia

Business & Management

. . News of the Industry

Oregon Herbicide Plant for Chipman

A 2,4-D plant, the first of its kind in the Pacific Northwest, is now being erected by Chipman Chemical Co., Inc. at Portland, Ore., adjoining the firm's present district office and factory.

Included in the product line will be a variety of 2,4-D and 2,4,5-T herbicides, 2,4-D acid and technical ester forms (including low-vol) of 2,4-D and 2,4,5-T. The new unit will also play an important role in Chipman's mid-western operations, shipping acid and technical esters to one of the firm's three plants in that region.

Umbaugh to Build Ind. Fert. Plant

A $300,000 fertilizer plant will be built at Jasonville, Ind. by the Umbaugh Agricultural Chemical Co., Memphis, Tenn. Roy Umbaugh, company president, stated that work would begin soon to make possible initial operation by April 1.

Located on a spur of the Monon railroad two miles east of the town, the factory will employ 25 men. When completed it will serve farmers in a 60 mile radius.

Aircraft Treat One of Six Acres in '55

One acre out of every six in the country was dusted, sprayed, fertilized or seeded last year by aircraft, according to a report from the U. S. Weather Bureau.

In dollar volume of business, agricultural aviation is now the third largest segment of the aviation industry, the report states.

There is a fleet of 7,000 aircraft in the agricultural aviation industry, and total time flown last year was equivalent to 33 per cent of the number of hours flown by civil airlines.

Aerial pest control, weed control and fertilizing add an estimated $3 billion to the annual farm income, the bureau points out.

Texas Co. Plans Ill. Nitrogen Facilities

Latest in the roster of firms with nitrogen production in mind is the Texas Company. Augustus C. Long, president states that next year, at the Lockport, Ill. refinery, "we plan to begin construction of a 180-ton-a-day plant for the production of anhydrous ammonia and ammonia derivatives."

Some of the materials will be slated for industrial uses; the remainder is to be sold as fertilizer. The company has been increasing its activity in the chemical field since acquiring a 50 per cent interest in Jefferson Chemical Co. in 1948.

N. Div. Omaha Plant Adds Solution Units

This month Nitrogen Division will place in operation new facilities for production of nitrogen fertilizer solutions at its Omaha, Neb., plant. The materials will be of the ammonium nitrate and urea type marketed under Nitrana, Urana and Uran tradenames.

The expansion, underway for several months, will enable the division to expand service to customers in Nebraska, Iowa and neighboring states, adding to the present Omaha line of ammonia, urea-ammonia solutions and solid urea products.

Meyer to Handle Stauffer Fertilizers

Signing of a long-term exclusive sales agreement has been announced by Stauffer Chemical Co. and Wilson & Geo. Meyer & Co.

Under the agreement, the Meyer firm will widen its distribution n the West and Midwest to handle the increased output of new pelletized agricultural phosphates produced by Stauffer.

American Potash & Chemical Corp. President Peter Colefax and Wilson Meyer, president of the Meyer firm, recently reported that the long-standing arrangement under which Meyer represented AP&C in various western sales areas will not be renewed upon its expiration in mid-1956.

Expansion of American Potash and added responsibilities of the Meyer company have resulted in recent years in the development of divergent interests, and the firms arrived at the mutually agreeable decision to sever their old relationship.

O-M Seeks Control of F. H. McGraw

Another merger deal appears in the offing for Olin-Mathieson Chemical Corp. The firm is reported negotiating for control of a Hartford, Conn., construction firm—F. H. McGraw Co.

McGraw erected the Paducah, Ky., atomic energy plant, was recently awarded a $25 million Korean fertilizer plant contract and is slated to build a recovery plant for Continental Potash Corp.

Turner to Handle Mid-South Tests

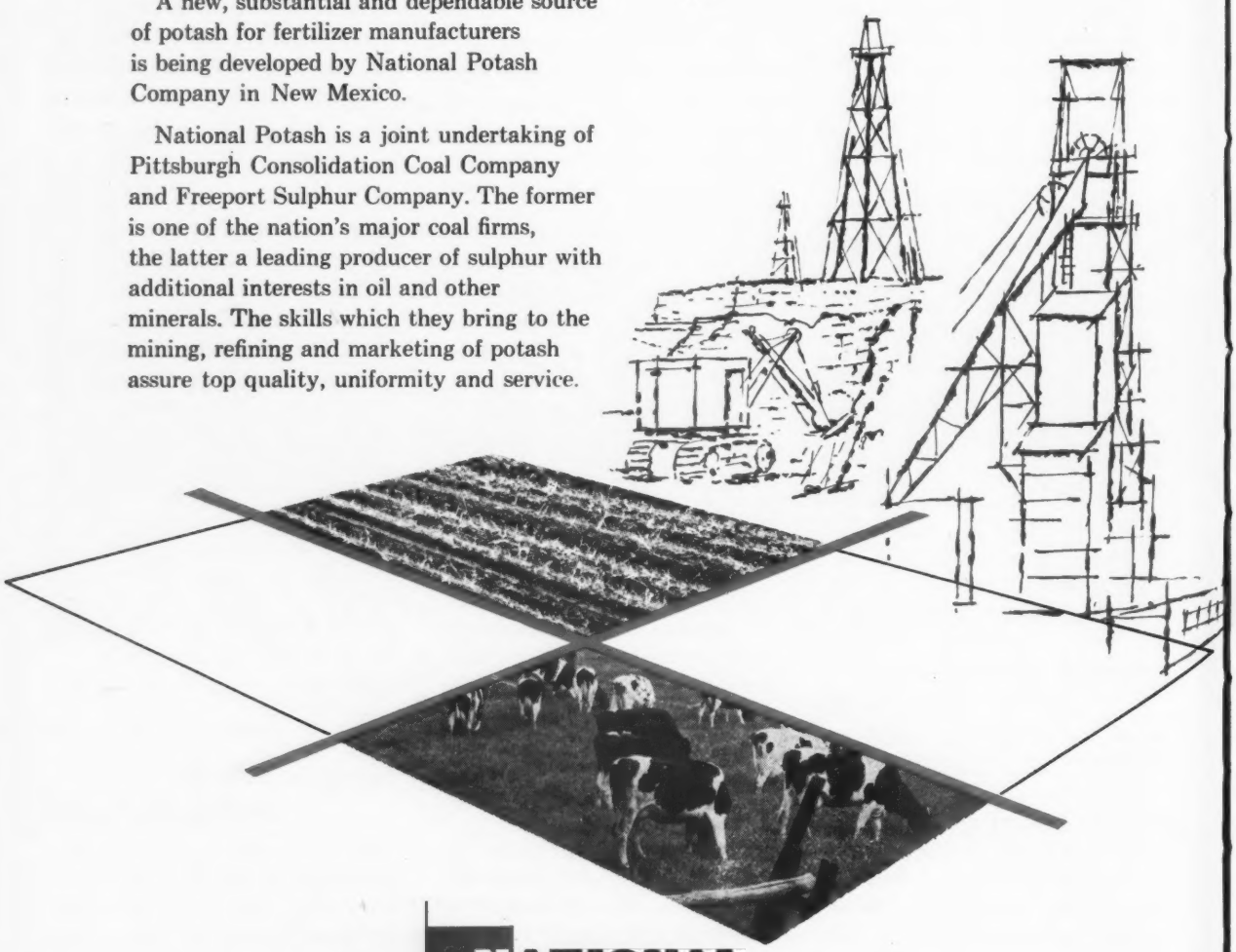
Steve Turner Farm Seeds & Plant Foods, Pontiac, Ill., has been selected by Mid South Chemical Co. to do its soil testing in Illinois and Indiana.

The Turner firm is now issuing every two weeks a four page farm news sheet for its customers.

a joint venture in Potash

A new, substantial and dependable source of potash for fertilizer manufacturers is being developed by National Potash Company in New Mexico.

National Potash is a joint undertaking of Pittsburgh Consolidation Coal Company and Freeport Sulphur Company. The former is one of the nation's major coal firms, the latter a leading producer of sulphur with additional interests in oil and other minerals. The skills which they bring to the mining, refining and marketing of potash assure top quality, uniformity and service.



NATIONAL POTASH COMPANY

205 EAST 42nd ST. • NEW YORK 17, N. Y.

BE IN BUSINESS . . . AND MAKING MONEY . . .

TWO DAYS after delivery!

Complete Plant for Insecticide Production — in one compact, Ready-to-Run Unit!*

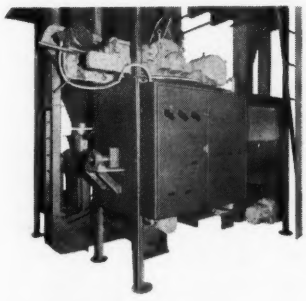
Proven design—engineered and packaged in one unit.

Low setting-up costs—no engineering, no guesswork, no delays and nothing to add.

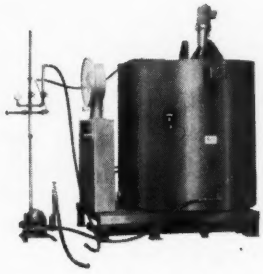
High production capacity in small space. Dual 40 cu. ft. model compounds two to four 1200 to 1500 lb. batches of dust concentrate per hour or six to eight batches of field strength dust. Takes only 9′ by 12′ space with 13′ headroom—on one floor in existing buildings. Standard 40 cu. ft. model has same production capacity of field strength dusts. Both dual and standard Uni-Blenders made in 56 cu. ft. models to handle 1600 to 2000 lb. batches.

Tested in our factory and ready to produce for you just two days after delivery.

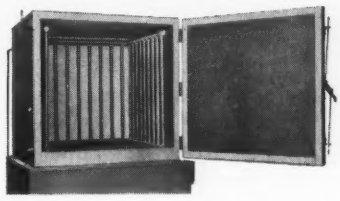
R.T.R.* Uni-Blender is a single unit, small space insecticide production plant. Dual model shown—mixes, blends, packages insecticide dusts in concentrated or field strength form, from ingredients requiring reduction in particle size or liquid impregnation.



Latest design dust-tight control panel made by a nationally-known manufacturer, view from opposite side of Uni-Blender. At top is 3TH Mikro pulverizer for grinding chemicals up to 95% + 325 mesh.



Toxicant measuring and blending tank, water jacketed with emersion heaters in the jacket for temperatures to 212°. Stainless steel inside tank is replaceable. Sizes 75, 200, 600 and 1000 gallons.



Open door of melt oven reveals heating tubes for steam at 125 psi to give 350° + oven temperature. For those chemicals, such as Toxaphene, used in making concentrates. Melting time, 30 to 45 minutes.

Write for new catalog and technical bulletins.

POULSEN COMPANY

2341 EAST EIGHTH STREET
LOS ANGELES 21, CALIFORNIA

Poulsen company

POULSEN COMPANY
2341 East Eighth Street
Los Angeles 21, California

Please send technical bulletins on these Poulsen Ready-to-Run Uni-Blender plants:

- ☐ R.T.R. Uni-Blender Insecticide Compounding Plants
- ☐ R.T.R. Uni-Blender Liquid Toxicant Formulating Plants
- ☐ Please send new Poulsen Catalog for 1956.

Name.....

Address.....

City.....State.....

RR Rate Increase Opposed by NPFI

The National Plant Food Institute has filed with the Interstate Commerce Commission a protest and request for suspension of proposed increases in freight rates on fertilizer and fertilizer materials. Such a move, said Paul T. Truitt, executive vice-president, "would impose an insurmountable hardship on farmers and the fertilizer industry.

Truitt emphasized the assumption that increased freight charges could be absorbed by the industry or by the farmer is not true in the case of fertilizers. "Freight rates now constitute," he stated, "a disproportionately high share of the total cost of fertilizer and this at a time when farm income is near disastrously low levels."

The application is also protested by USDA secretary Ezra Taft Benson who has petitioned the ICC to suspend the railroad's request for a seven per cent increase in rates for not only fertilizers but also raw and processed farm products, other farm supplies and fish. Benson pointed out that approving the application would have a deleterious effect on current effort to improve the farmers' economic status.

Organic Fert. Unit For Pa. City Waste

Organic fertilizer will soon be produced from McKeesport, Pa., garbage and rubbish by the Organic Corp of America, Pittsburgh. Orcoa is reported to have spent $250,000 converting a former city incinerator into a humus factory capable of handling about 150 tons of raw material per eight hour shift.

Howard G. Burr, president of the firm, estimates that it will reduce garbage collection and disposal costs by two-thirds at an annual savings of $25,000. McKeesport will be paid $3,000 annual rental for the plant and will receive 50 tons of fertilizer for park use.

Highlights of MWSIC Meet

Here are some highlights from the initial portion of the college agronomists-fertilizer industry joint meeting sponsored by the Middle West Soil Improvement Committee, February 16–17 in Chicago. More will be presented next month.

- Data from Minn. show that addition of nitrogen in ammonium form substantially increased phosphorus intake, especially by corn.
- Differences in efficiency between various nitrogen forms were questioned by one researcher, under normal weather conditions.
- Iliac, an electronic brain, has helped plan farm cropping and livestock operations for maximum profit regardless of rising or falling prices.
- Some 200,000 tons of fert.-insecticide mixtures were used last year with application saving farmers $1.40 per acre, said an industry spokesman.

Plan Expansion of Mexican S Plant

A $1.5 million expansion of its sulfur plant in Vera Cruz, Mexico, soon will be undertaken by Pan American Sulphur Co., according to recent reports. Completion is scheduled for September.

Daily production capacity will be increased from 2,000 tons to more than 3,000 tons.

Totman Reports on Progress at NCI

Construction work on the Northern Chemical Industries expansion projects at Searsport, Me., continues on schedule, according to J. E. Totman, president. The last unit of the new nitrogen plant, largest of the projects, is scheduled on stream during June.

A 7,500 KW power plant was to be completed late in January with nitric acid and nitrogen fertilizer solution units ready about the first of this month and the NH_3 line during June. A fleet of 45 tank cars painted in State of Maine colors will service industrial and agricultural customers.

NCI will have the only nitrogen plant in the Northeast above Philadelphia and will be the first company in North America to produce NH_3 exclusively from Bunker "C" oil under the Texas Oil-Hydrocarbon Research process. The Girdler Co. is constructor.

Leonard Construction Co. is erecting a 100 ton per day sulfuric acid contact plant needed to fill demands from the pulp and paper industry and to meet increased sales of ammonium sulfate and superphosphates. When completed it will bring total rated capacity to 170 tons of 100 per cent acid per day with actual production in excess of 200 tons.

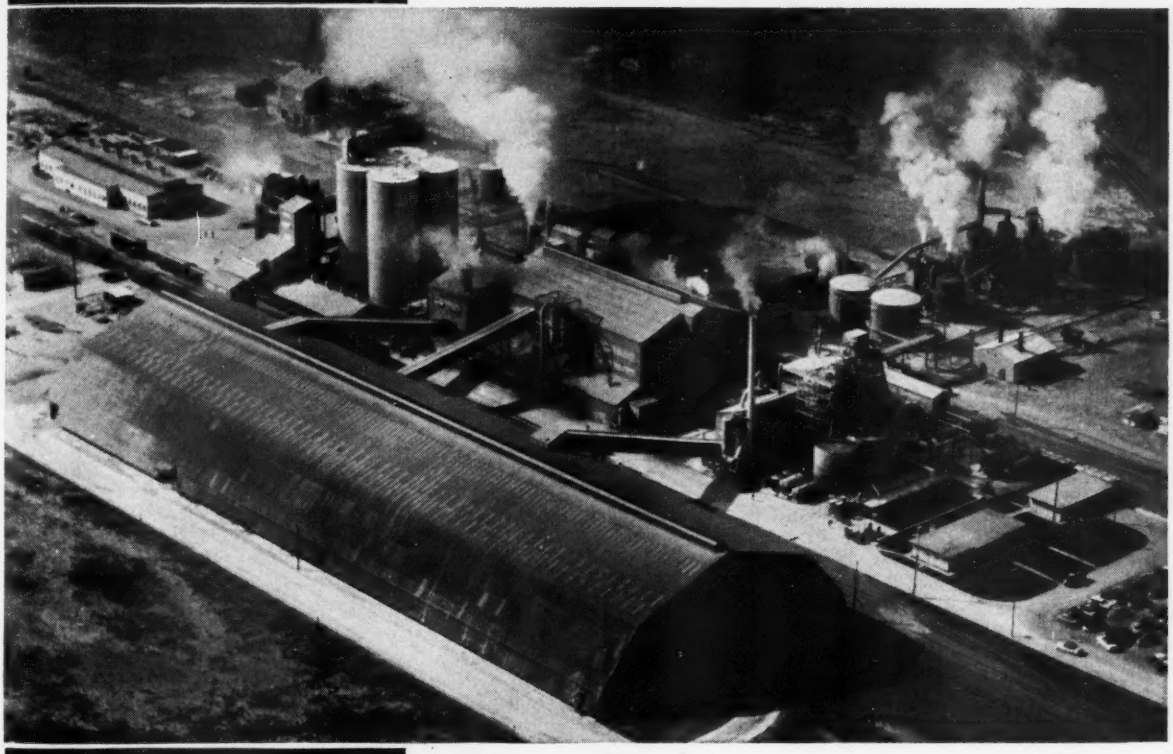
NCI is also increasing daily production of synthetic ammonium sulfate and has augmented alum delivery schedules by adding several specially built tank cars.

New Florida Plant Planned by Swift

This fall, a new Swift & Co. fertilizer plant at Pompano Beach, Fla., is scheduled to begin operation. Construction work is expected to begin shortly.

International MINERALS CHEMICALS

Bonnie giant with a fine-textured touch



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This giant International plant at Bonnie, Fla., adds the touch of fine texture to International's Triple Superphosphate — controlled uniformity of particle size, even density and low-moisture. These improved physical properties reduce your formulation costs. Promote better granulation. Give the same excellent ammoniation in batch after batch.

International's superior texture lets you operate at higher ammoniation rates and temperatures, too, for more economical formulation. Result: lower manufacturing costs; better agglomeration; and case-hardened, free-flowing, granular fertilizer products that farmers prefer. Write or wire for samples and quotations.

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These thoroughly tested insecticides control over

TOGETHER, these three powerful Shell insecticides effectively control most major pests that attack important crops. At the present time, continuing experiments and research promise even wider uses. Here are some of the major crop pests successfully controlled by aldrin, dieldrin, and endrin.

COTTON—Aldrin, dieldrin, endrin control such major cotton pests as boll weevil, thrips, cutworms, flea-hoppers, plant bugs. Endrin controls *both* boll weevils and bollworms. With aldrin and dieldrin, simply add DDT for bollworms.

CORN—Aldrin in the soil controls rootworms, wireworms, white grubs, seed corn maggots and other sub-surface pests . . . aldrin is also used extensively for soil insect control on many other crops.

PUBLIC HEALTH PESTS—Dieldrin stops mosquitoes, houseflies, fleas, ticks, chiggers, and others.

TOBACCO—Endrin controls horn-worms, budworms, grasshoppers, flea beetles, and cabbage worms.

VEGETABLES—Dieldrin controls: tuber flea beetle larvae, Colorado potato beetles, sweet potato weevils, onion thrips, cabbage maggots, loopers and many other insects attacking vegetables.

FRUIT PESTS—Dieldrin controls: plum curculio, lygus bugs, stink bugs.

NURSERY AND GARDEN PESTS—Dieldrin controls such well-known garden destroyers as ants, white grubs, chinch bugs, earwigs, gladiolus thrips, and others.

SEED TREATMENT—Dieldrin controls: true and false wireworms, seed corn maggots, ants.

To help you achieve the most effective aldrin, dieldrin, and endrin formulations, Shell provides the finest in technical service . . . and field representatives who work with growers, county agents, and extension entomologists. Also, powerful advertising at the right time helps you make sales. Write for the very latest in technical information on these three outstanding insecticides.

and approved Shell 100 major insect pests

aldrin
dieldrin
endrin

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CCC to Construct Two Acid Plants

Contracts for two sulfuric acid plants have been awarded to Chemical Construction Corp. Designs and equipment will be supplied for a contact plant to be constructed by Western-Knapp Engineering for Kenecott Copper Co. at Hayden, Ariz. Roaster gas will be used as raw material for the 100 tons per day unit.

Shawinigan Chemicals, Ltd., Canada, contracted the second facility, a 75 tons per day contact unit to be located at Shawinigan Falls, Quebec. CCC will handle design, equipment and construction.

New Offices

A new district sales office has been opened by Columbia-Southern Chemical Corp. in Houston, Tex., under the direction of C. K. Ballard, district sales manager. W. J. Bramblett will serve as assistant district sales manager.

Shell Chemical Co.'s Agricultural Chemical Sales Div. has moved the office of its recently consolidated Delta-Houston district from Jackson, Miss., to 119 S. Claiborne, New Orleans, La. The district will be named New Orleans, with J. F. White continuing as district manager.

NH_3 Rig for Use on Hardpan, in Trash

W. H. Rogers, equipment engineer for Plant Food Corp., has developed a new heavy duty NH_3 rig that both applies the nitrogen in the deep root zone and subsoils and chisels the soil.

J. J. Bingham, vice president of the firm, says that the machine can be used on hardpan, cotton or milo stubble or through weedy and grass trash.

Ammonium Nitrate Unit for Hopewell

New facilities will be installed at Nitrogen Division's Hopewell, Va. plant for the production of solid ammonium nitrate, 33.5 per cent N. They are expected to be in operation near the end of this year.

Hi-land Air Duster For New Zealand

In New Zealand, a twin-engined Dakota, called the Hi-Land Duster, has been equipped for aerial top-dressing and is reported to carry a five ton load of fertilizer for distribution of granulated material over a radius of 40 to 50 miles.

FERTILIZER & FEEDING STUFFS JOURNAL states that 15 months and £45,000 were spent on converting the military plane. During suitable weather 20 flights per day can be made.

Ship First Miss. River Solutions

First shipment of ammonium nitrate solution from the new $16 million Selma, Mo., plant of Mississippi River Chemical Co. Left to right are John L. Sanders, MRC sales manager; James W. Mathers, Bradley & Baker; Cecil Lashlee, plant manager, and R. G. Powell, technical service director, MRC.

Services Added by Pa. Farm PR Firm

The Agricultural Information Service, a farm public relations firm, reports it is broadening its services to assist manufacturers, distributors, trade associations and others in putting out news that is "tailor-made" to reach farmers and their families.

At present the Butler, Pa. firm is editing the monthly publications and handling publicity of three large farmer organizations. It also produces transcribed material for use on farm radio programs.

Witco PR Firm

Witco Chemical Co. has named Gaynor Colman Prentis & Varley, Inc., its public relations counsel.

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IN YOUR FUNGICIDE AND FERTILIZER FORMULATIONS

Since 1885, successful growers have preferred Triangle Brand Copper Sulphate in fungicides. It has consistently proved itself more effective and superior to organic materials; in sprays, where Bordeaux Mixture is the most reliable, or in dusts, if preferred.

In mixtures and emulsions, it is compatible with virtually every other pesticidal material. In fertilizers, it is important for enrichment of the soil and its use guarantees larger, healthier and more profitable crops. Forms of Triangle Brand Copper Sulphate available are:

INSTANT (powder) for quick and efficient mixing of Bordeaux sprays.

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Chem. Construction Surveyed by MCA

About $1.6 billion will be spent on new chemical construction through 1956 and 1957, according to a survey covering 599 projects by the Manufacturing Chemists' Association. Privately financed chemical construction projects completed during 1955 totaled $772 million, the survey states.

Consolidation of completed, under construction or planned figures shows that last year the industry made its heaviest investment, $633 million, in heavy and fine organic chemicals; second largest, $481 million, in inorganic chemicals; and third largest, $433 milllion, for fertilizer chemicals.

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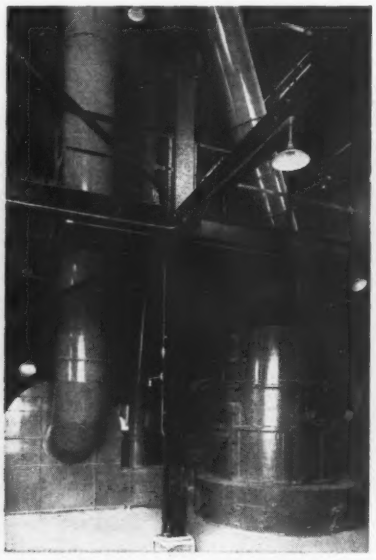

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Assets of Parkers Browne to Spencer

Assets of Parker-Browne Co., producers of liquid carbon dioxide and dry ice, have been purchased by Spencer Chemical Co. Spencer now produces carbon dioxide at its Jayhawk Works, and the newly acquired facilities will nearly double its capacity in addition to providing strategic shipping points for improved service to the Southwest and midwest.

O-M Wins Damage Suit in Arkansas

A $280,000 damage suit filed last spring by Arkansas Plant Food Co. against Olin Mathieson Chemical Corp. has been dismissed by the U. S. District Court.

The Arkansas firm charged Olin Mathieson with violating the Robinson-Patman Act by charging it higher prices for superphosphate than those charged other purchasers. Said Sam Nevins, vice-president in charge of O-M's plant food division—the dismissal (with prejudice) by agreement is a vindication of O-M practices.

Phosphorus Plant For Hamilton, Ont.

Hamilton, Ontario, has been selected by Electric Reduction Co. of Canada Ltd. as site for their next multi-million dollar expansion, a phosphorus plant. Plants to produce sulfuric acid and "wet-process" phosphoric acid also will be installed.

The company recently completed a $6 million plant at Varennes on the St. Lawrence River to meet Canada's growing requirements for phosphorus and its derivatives. An active drive on export markets also has increased demand on its present production capacity.

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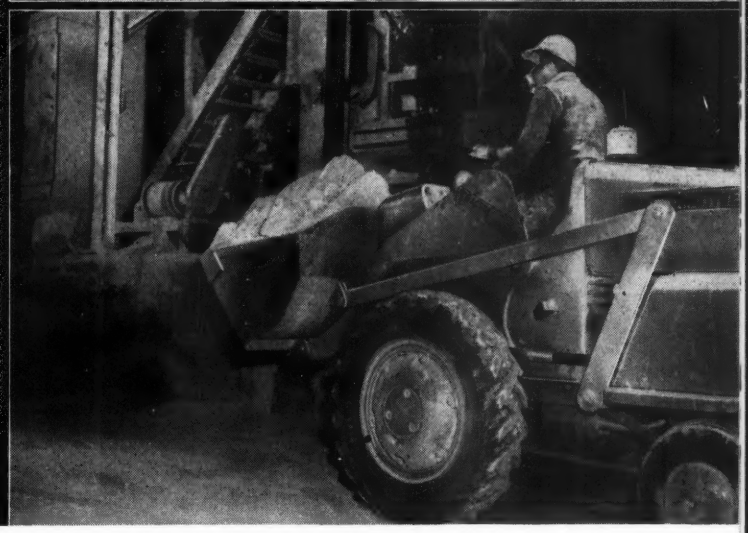

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a high producer in confined areas

No ramming into pile to fill the half-yard bucket of the TL-6 Tracto-Loader. Operator lets the hydraulic torque converter do the crowding — smoothly, steadily . . . and there's a scooping action, too, with the tip-back bucket. You get a heaping load before the booms are halfway up.

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Operator has an easy time handling the TL-6. No gear shifting — he just pulls or pushes a lever to change direction. Short, 6½-foot turning radius and over-all compact design make it easy to unload box-cars or travel through narrow aisles and doorways, make hairpin turns near columns and posts.

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Spencer Head Sees Nitrogen Surplus

The possibility of a nitrogen surplus last month again cropped up in the news. Kenneth A. Spencer, president of Spencer Chemical Co., pointed to the likelihood of a 15 to 20 per cent surplus plant capacity for the next several years.

Addressing the New York Society of Security Analysts, Spencer estimated current ammonia operating capacity at 4,143,000 tons from 43 plants with 11 plants scheduled on stream next year bringing the total to 4,896,000 tons.

Cyanamid Research Units Consolidated

All research activities of American Cyanamid Co. have been consolidated into a single division, headed by Kenneth H. Klipstein, division manager.

A plan involving grouping related activities in laboratories at Bound Brook, N. J.; Pearl River, N. Y. and Stamford, Conn. is now being implemented by the division.

At Bound Brook and Pearl River, construction of additional facilities has already begun.

The New Jersey facilities will house research activities primarily related to the organic chemicals and pigments divisions. All Cyanamid research in the pharmaceutical and biological fields will be centralized in one location at Pearl River.

Research in the agricultural, industrial chemical, plastics and mineral dressing fields will be carried out at Stamford.

First shipment of mixed fertilizer from Stauffer's Vernon, Cal., plant.

New Incorporations

Southern Nitrogen, Inc. has filed at Montgomery, Ala. With authorized capital stock of $1,000, the firm will manufacture and process fertilizers, alkalis and explosives. Officers are P. J. Cullen, president; George A. Van Pelt, secretary, and William A. Hamlin, treasurer.

Southern Nitrogen Co., Inc., Durham, N. C., has been granted a charter to deal in chemicals with authorized capital stock of 100 shares, no par value. Incorporators are R. P. Reade, F. L. Fuller, Jr. and James L. Newsome.

Mixed Goods from Stauffer's Vernon

Shipments of pelleted mixed fertilizer have begun from Stauffer' Chemical Co.'s new million dollar Vernon (Los Angeles), Calif. plant. Although the initial output was of 17–7–0 grade, current plans also include production of 5–15–0, 10–10–5, 10–10–10 and other special grades as well as pelleted single superphosphate.

Using a manufacturing process developed by Stauffer research engineers, the plant is the first of several like it to be built by the company in the west. Wilson & Geo. Meyer & Co. are exclusive sales agents for Stauffer fertilizers.

The Labor Front

Operations at Davison Chemical Co.'s New Albany, Ind. plant were discontinued as some 35 AFofL workers went on strike, on January 23, for an eight cent an hour wage increase.

The first strike experienced in 38 years by Pacific Coast Borax Co. was ended with a loss of four days production following a compromise wage agreement. An increase of 11¾ cents an hour settled the strike which involved the PCB mine, mill and refinery.

FAO Shows World Plant Food Gains

World production of fertilizers gained sever per cent from 1954 to 1955 according to the UN's Food & Agriculture Organization and will gain four per cent in 1955 to 1956. During the same periods, consumption increased four and three per cent respectively.

The agency estimates that during the three year period dating from mid-1953, production and consumption of plant foods will gain 21 and 18 per cent respectively.

Complete information on world wide figures for output and use of plant foods and materials is contained in "An Annual Review of World Production and Consumption of Fertilizers, 1955," published by the FAO. The 86 page booklet costs one dollar and can be obtained in this country from the Columbia University Press, International Documents Service, 2960 Broadway, NYC 27.

In Canada it is handled by The Ryerson Press, 299 Queen St. W., Toronto 2, Ontario or Periodica, 5112 Ave. Papineau, Montreal 34.

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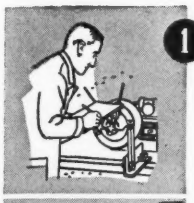
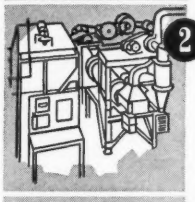


1 MODERN LABORATORIES have both miniature and full-scale facilities—offer free testing service on a few pounds or full carloads of your material. Link-Belt will also lease equipment for work in your plant.



2 PILOT PLANT and testing station, operated in cooperation with a leading university, continually works to find new ways to improve commercial fertilizer ... adapt laboratory procedures to plant conditions.

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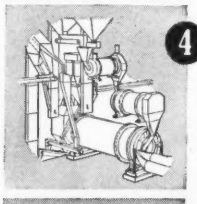
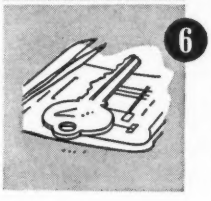
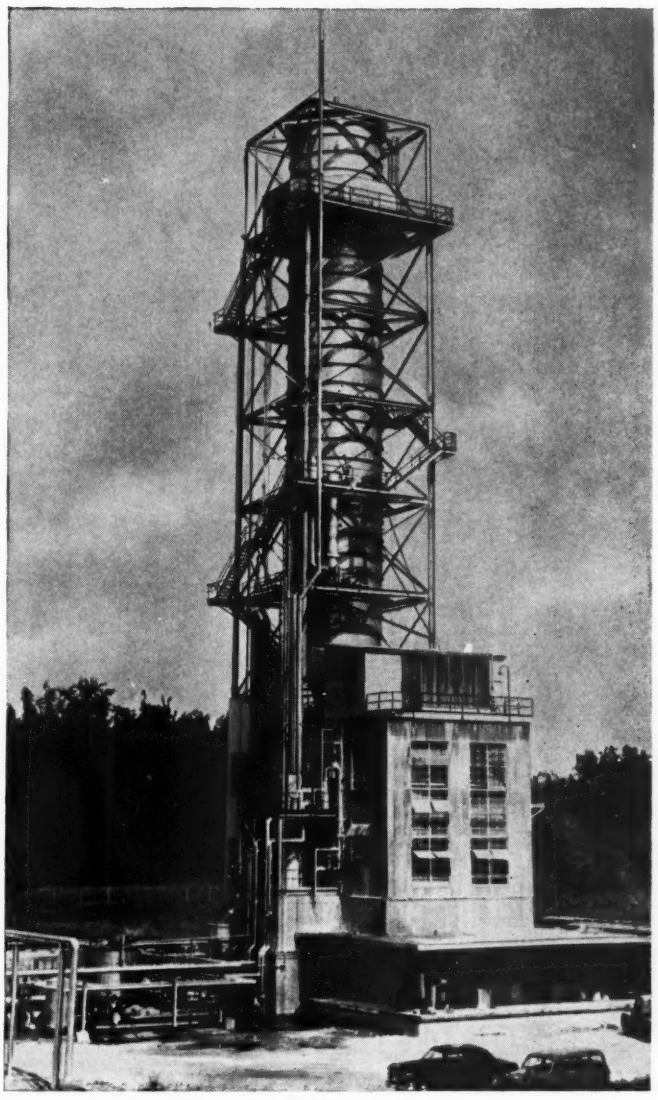


4 LINK-BELT EQUIPMENT includes dryers, coolers, granulating drums, disintegrators, continuous mixers, ammoniators, roll crushers, all types of conveyors & elevators, vibrating screens, all types of chains & power transmission machinery.

5 SKILLED ERECTION CREWS When you rely on Link-Belt as a single source, Link-Belt accepts responsibility for placing your plant in full operating readiness. We will also supervise modernizing existing plants.



6 SATISFACTORY MECHANICAL PERFORMANCE can be assured. Link-Belt experience includes dry-mix, superphosphate, nitrophosphate, ammonium nitrate, ammonium sulphate, urea, granulation and other plants.



In this southern ammonium nitrate plant, Link-Belt supplied conveying, drying, cooling, mixing, elevating and screening equipment for a fully integrated system.

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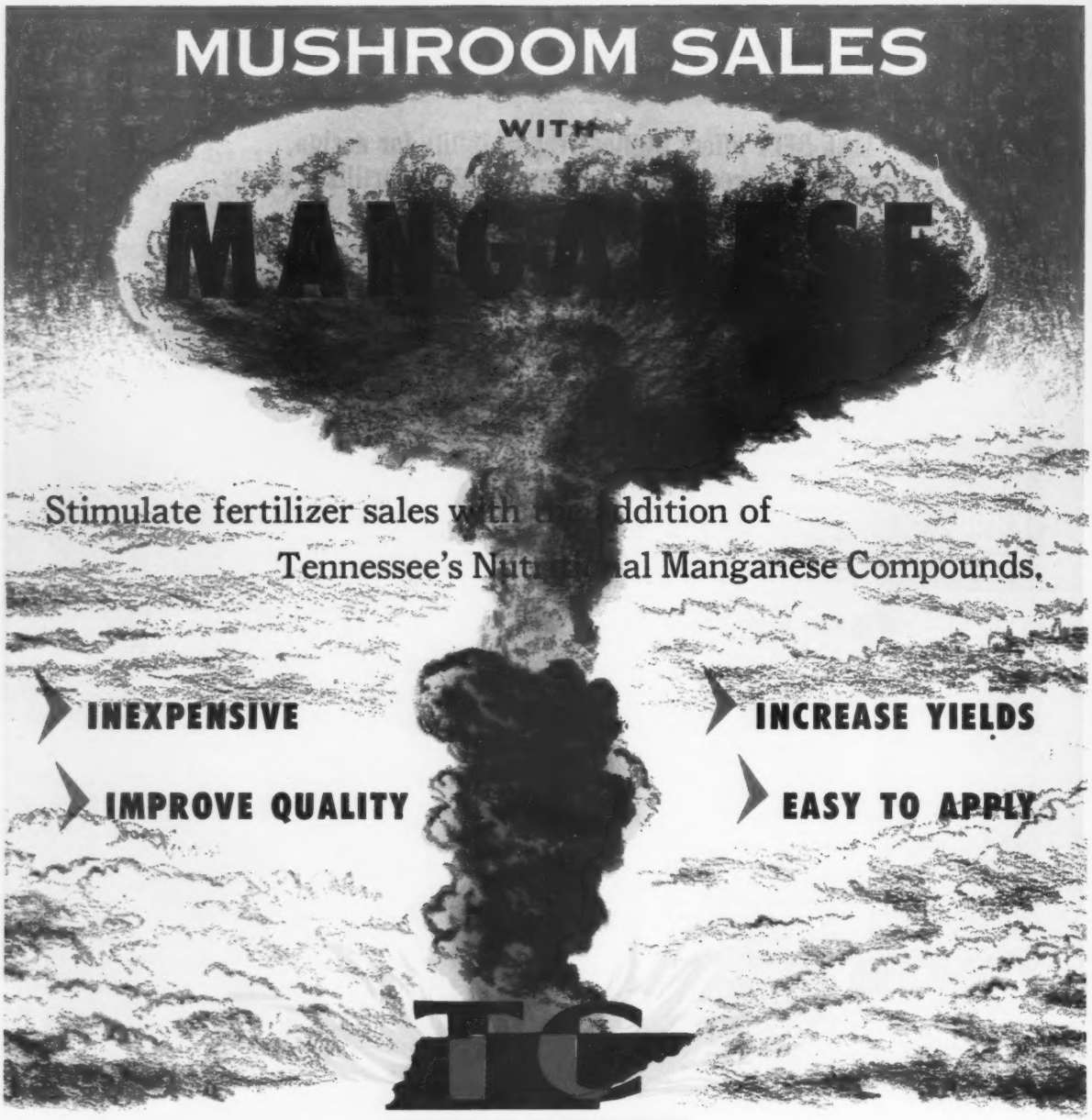

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MANGANOUS OXIDE—TENNESSEE NU-MANESE
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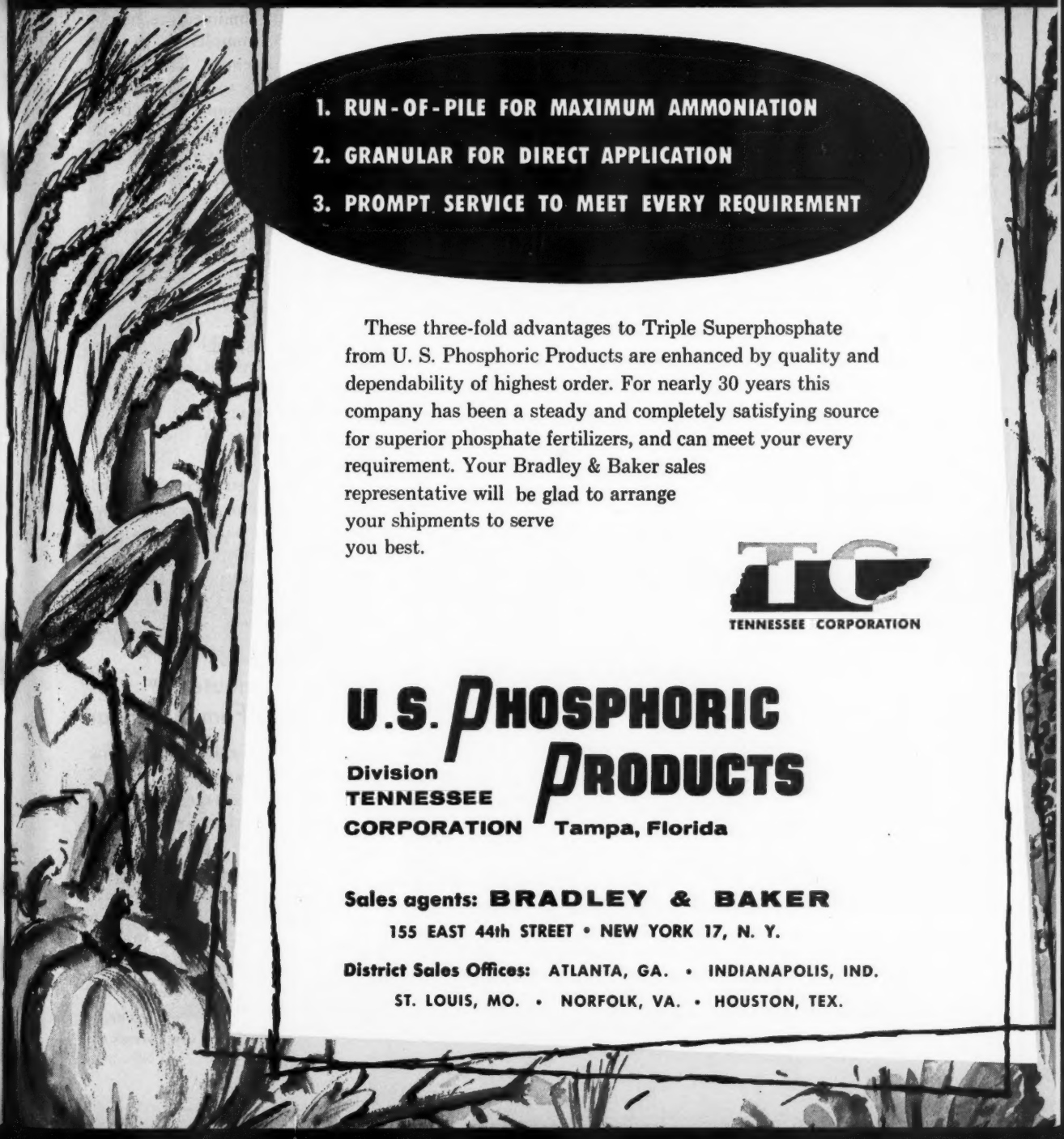

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Wage-Hour Compliance

By the U. S. Department of Labor

Wage & Hour & Public Contracts Div.

On March 1, 1956, the minimum wage under the Fair Labor Standards Act will be raised from 75 cents to $1.00 per hour. That some firms in the fertilizer industry need fuller understanding of this Federal Wage-Hour Law was revealed during the course of investigations made in the 1955 fiscal year by the U. S. Labor Department's Wage and Hour and Public Contracts Divisions, the agency which administers the Act.

Misapplication of the minimum wage and overtime pay provisions caused investigated firms to owe $59,456 in back wages. With the minimum wage going up to $1.00 an hour, violations next year can be even more costly.

During fiscal 1955, Wage-Hour representatives investigated 58 establishments in the industry. They found 39—67 per cent—in violation of the minimum wage, overtime pay, or child-labor provisions, with respect to one or more employees.

Of the 2,651 covered employees in the 58 investigated establishments, 499—19 per cent of those covered—were not paid all that was legally due them. By the year's end, 33 of the violating firms had agreed to make back-wage payments totaling $28,302 to 378 employees.

The most common violation was of overtime provisions, with 62 per cent of the investigated establishments failing to comply, while 19 per cent showed underpayment of minimum wages. A total of $34,883 of the back wages owed was due to violations of the overtime provisions; $24,573 was due to minimum wage violations.

It was also found that seven per cent of the investigated establishments were employing young people illegally. Child-labor violations, like pay violations, can result in penalties.

While the Divisions' investigation findings show there are many establishments in the fertilizer industry that could improve their compliance record, it does not mean the findings are representative of compliance in the industry as a whole. The rate of violations tends to be overstated, because the Divisions concentrate investigator time where there is reason to believe violations will probably be found.

In the great majority of cases in fiscal 1955, investigations disclosed that violations were unintentional, occurring because employers were uncertain about how to apply the law. To help clear up compliance problems and prevent costly violations in the future, FARM CHEMICALS will run in the April issue an article on the major provisions of the Federal Wage-Hour Law.

Among the subjects discussed will be coverage, exemptions, some overtime pay problems, how to avoid illegal hiring of child labor, and other important questions which the fertilizer industry wants answered.

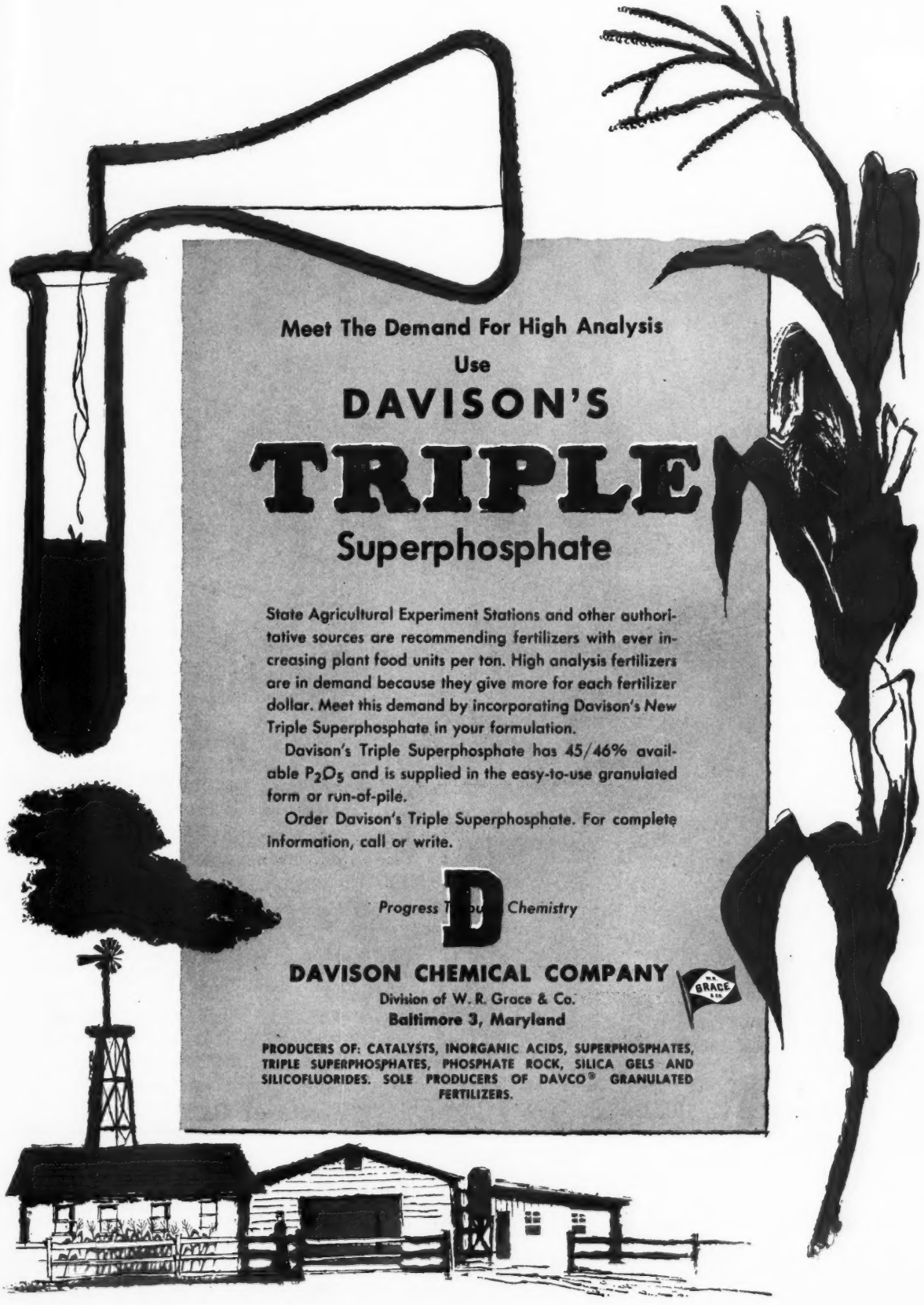
Spencer Host to FFA Growers

A few of the 23 FFA "efficiency experts" in the art of growing corn who gathered in Kansas City recently as guests of Spencer Chemical Co. They represented the top participants in Spencer's 1955 Efficient Corn Growing Program, and accompanied by their vo-ag instructors met Feb. 2-4 for 3 days' activity—banquets, sight-seeing and a trip to Spencer's Jayhawk Works.

d-Con Distributes New Farm Calendar

An unusual calendar is being distributed this year by d-CON Co. through retailers and at conventions, fairs and trade meetings.

On one side appear months and dates, while the other side is a chart which lists the time periods various animals require for reproduction, emphasizing the brief time it takes rats and mice to have young.



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State Agricultural Experiment Stations and other authoritative sources are recommending fertilizers with ever increasing plant food units per ton. High analysis fertilizers are in demand because they give more for each fertilizer dollar. Meet this demand by incorporating Davison's *New* Triple Superphosphate in your formulation.

Davison's Triple Superphosphate has 45/46% available P_2O_5 and is supplied in the easy-to-use granulated form or run-of-pile.

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Division of W. R. Grace & Co.

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PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, TRIPLE SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS AND SILICOFLUORIDES. SOLE PRODUCERS OF DAVCO® GRANULATED FERTILIZERS.

PEOPLE

American Agricultural Chem. Co. personnel moves: R. M. Richey, former superintendent at Baltimore, named divisional superintendent for Alexandria, Va., Baltimore, Md., Cincinnati O.; Henderson, N. C.; Norfolk, Va. and Washington Court House, Ohio.

J. A. Layton succeeds Richey as Baltimore superintendent; R. M. Ludwig named director, Chemical Control Dept.; J. J. Graham, manager and B. E. Thorne, assistant manager, New England sales office, North Weymouth, Mass. R. R. Johnson, assistant manager, Humboldt, Ia. branch; E. B. Stalnaker, Jr., assistant manager, Buffalo sales office; and R. P. Cagley, assistant sales manager, East St Louis, Ill. branch.

American Smelting and Refining Co. Donald K. Wright succeeds L. G. Matthews as manager, by-products sales, following Matthews' retirement on Dec. 31.

American Potash & Chem. Corp. William J. Hutchinson has been named a director, fill ng the vacancy created by the death of W. J. Murphy.

Armour Fertilizer Works. F. L. Wooten, Jr., manager of the Wilmington, N. C., div., has been transferred to the Atlanta general office as unit sales manager. He is succeeded in Wilmington by J. H. Pate, former assistant manager at Norfolk.

Atkins, Kroll & Co. Robert T. Brownscombe joins the firm to handle fertilizer sales. He had been with the California Dept. of Agriculture, Spreckels Sugar Co., San Joaquin Valley Poultry Producers Assn. and most recently with Calif. Farm Supply Co.

California Spray-Chemical Corp. Dr Malcolm H. McVickar has been appointed chief agronomist for Calspray. Formerly chief of agronomic education for the National Plant Food Institute, his new appointment will become effective April 1.

McVickar

McVickar will make his headquarters at the company's home office in Richmond, Calif., where its parent company, Standard Oil Co. of Calif. is setting up a new $16 million fertilizer operation, scheduled for completion by early fall.

Carbide & Carbon Chemical Co. New supervisor of marketing information services is E. L. Meadows.

Climax Molybdenum Co. Dr. John G. Dean, chemical and metallurgical consultant, has been retained to advise on certain aspects of the firm's recently expanded chemicals program.

Columbia-Southern Chemical Corp. Appointment of Martin G. Levens as Philadelphia district sales manager recently was announced. A graduate of Gettysburg College, Levens joined Columbia-Southern's Cleveland sales office during 1947, and has served as assistant district sales manager at Philadelphia during the past year. He succeeds Paul A. Fodor, Jr., recently named assistant director of sales for the firm.

Levens

Commercial Solvents Corp. is expanding its farm chemicals marketing and distribution organization in the South, reports Clyde T. Marshall, general manager of the Agricultural Chemicals Dept.

Massey K. McConnell has been named southern district sales manager with headquarters at the Sterlington, La., plant. A graduate of Louisiana State University, he joined CSC in August 1954 as a sales representative for ammonium nitrate in the South.

McConnell

William M. Hemeter has been named to the Southern District sales organization. His home is in Hattiesburg, Miss., where for the past 20 years he has been engaged in fertilizer production and sales.

Hemeter

d-CON Co. J. S. Garland has been named southeastern regional representative.

Diamond Alkali Co. John W Kennady, general manager of Diamond Black Leaf Co. since its formation in February 1955, succeeds L. J. Polite, Jr. as agricultural chemicals sales manager in DA's Chlorinated Products Div. Polite now becomes product sales manager for a diversified group of organic chemicals, replacing W. B. Beeson, Jr., recently named manager of Diamond's New York-New England branch sales office in New York City.

Also announced were promot on of J. C. McKenna to the new position of manager, soda products sales; Clayton M. Holt to manager, chlorine and hydrogen sales; William L. *(to page 28)*

"Best time-saver I know of

is the burlap bag," says A. R. Baggett, prosperous truck-farmer of Suffolk, Virginia. "There's no wasted, spilled fertilizer with strong-seamed burlap bags that stand up to rough handling. They stow better and take less men for loading and unloading. I've been a burlap man for 35 years—*was, have been, and always will be.*"

Time-saver, money-saver—no wonder burlap is the farmer's favorite bag. Suppliers who are trying to serve the farmers' best interests pack fertilizer in burlap bags. Fertilizer keeps better in ventilated burlap bags and handles easier in the tough, heavy-duty burlap. You can save your own time and money by packing in the good old standby—burlap.

Just ask your own customers—

they'll tell you that burlap

Is strong — takes dragging, dropping, *man-handling* — any tough job on the farm.

Gives good ventilation — keeps farm supplies and products fresh.

Laughs at sudden showers — wetness or dampness can't weaken it.

Saves money — extra value from re-sale and re-use.

Saves storage space — stacks to any height without slipping.

Has 1000 uses — always in demand on the farm (popular with farm wives, too!)

THE BURLAP COUNCIL

of the Indian Jute Mills Association

155 East 44th Street, New York 17, N. Y.

Presenting

THE MOST MODERN BAG PRINTER

Manufactured in

One, Two, Three and Four Colors for printing made up bags of Paper, Cotton and Burlap, new or used.

Let us send you complete information with descriptive literature.

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best, by far, for *shipping and storing fertilizers*

MULTIWALLS

by

CHASE BAG

there's nothing better!

Chase is also your best source for Burlap and Cotton Bags

Place your next order with

CHASE BAG COMPANY General Sales Offices: 309 W. Jackson Blvd., Chicago 6, Ill.

Personal Service and Prompt Shipments from 32 Nation-wide Branch Plants and Sales Offices

. . . People

(*from page 24*) McFadden to manager, caustic soda sales.

Two additional autonomous units have been created, the Electro Chemicals Div., with Frank Crencik as general manager, and Soda Products Div., with Henry B. Clark as general manager.

Diamond Black Leaf Co. George V. Dupont has been promoted to general manager, succeeding J. W. Kennady, who recently returned to Diamond Alkali.

Formerly manager of manufacturing operations for DBL, Dupont has a broad chemical engineering background dating back to 1940, when he joined Diamond Alkali.

Two sales and service representatives recently appointed are James H. Hoskins, San Francisco area; and Oliver R. Eames, Detroit area.

W. R. Grace & Co. Newly named director of research for Grace Chemical Research and Development Co. Div. is Donald L. Fuller. Dr. Fuller goes to Grace from American Cyanamid Co. where since 1952 he had been technical director for the firm's petrochemical plant in New Orleans.

Fuller

Louisiana Liquid Fertilizer Co. Appointment of W. C. Smith as manager is announced.

Wilson & Geo. Meyer & Co. Wilson Meyer, president, has been named president of the state agency which owns and operates the San Francisco Cow Palace, site of the 1956 Republican National Convention.

Monsanto Chemical Co. New technical service representative for the Inorganic Chemical Div. is Donald R. Fischer.

Olin Mathieson Chemical Corp. Samuel L. Nevins, vice president, was awarded an Honorary Doctor of Laws Degree, highest honor a college can bestow, at the mid-term convocation of the Univ. of Arkansas.

S. B. Penick & Co. Andrew Bela, former production supervisor for Monsanto, has been named plant manager of Penick's Lyndhurst, N. J., plant.

Pennsylvania Salt Mfg. Co. D. Buchheit is new sales-service representative in north Texas for the B-K Dept.

Pennsylvania Salt Mfg. Co. of Wash. Addition of Dr. Harold J. Miller to the Technical Development Dept. is announced by E. H. Karr, vice president. Dr. Miller, who has 11 years research experience in agricultural chemicals, joined Pennsalt in 1948 as plant pathologist at its Whitemarsh Research Lab. He will establish his new office at Tacoma, Wash.

Miller

Shell Chemical Corp. C. H. Daniels, recently returned from a special assignment, has been appointed to the Atlanta district as a sales development field representative. Also named to the Atlanta district is O. W. Whitehead, formerly with USDA, as a sales representative.

J. R. Simplot Co. Fred Grasser has been hired as assistant production superintendent by the Fertilizer Div. A chemical engineer, Grasser graduated from Wash. State College in 1951 and has been production engineer with Pacific Coast Borax.

Smith Agricultural Chemical Co. At the annual meeting of the firm held early this year, the board of directors was increased from 10 to 11 members. Earl F. Cline, an employee for 30 years, was elected to the board and named vice president. H. W. Lucks, with the firm for 28 years, also was named a vice president. George L. Pelton was named assistant secretary, succeeding Frank H. Nicklaus who has retired.

Stauffer Chemical Co. George L. Bond and E. S. Rothrock, former president and executive vice president respectively of Consolidated Chemical Industries, have been elected directors and vice presidents of Stauffer Chemical Co. Rothrock also has been appointed general manager of Stauffer's Consol. Chem. Ind. Div., principal office of which has been moved to Houston, Tex.

United States Potash Co. W. W. "Woody" Wilson has joined the firm as midwestern sales representative, to serve the territory previously handled by John E. Fletcher, who has been moved to New York as assistant sales manager. Wilson has been employed by the Farm Bureau Cooperative Assn. for the past seven years, and for the past few has served as director of purchasing.

Wilson

U. S. Rubber Co., Naugatuck Chemical Div. Martin J. Tierney has been named commercial development manager, replacing Clayton Reubensaal, who is now director of commercial planning for Texas U. S. Chemical Co.

Virginia-Carolina Chemical Corp. Joe Milburn has been appointed manager of the new distributing warehouse opened by V-C in Danville, Ky.

PHOTO COURTESY WESTERN GROWERS ASSN.

TRONA® POTASH *for Agriculture*

In 1917 state fairs were awarding prizes for outstanding farm products just as they are today. Then as now, growers depended on Trona® MURIATE OF POTASH for high quality crops. For it was in 1917 that Trona, first to produce domestic Potash when World War I pinched-off foreign sources, shipped the first train-load to the east coast. For the next twenty years Trona was the *only* domestic source of Potash and today, in spite of AMERICAN POTASH AND CHEMICAL CORPORATION'S broad diversification program, is still one of the primary basic suppliers of high grade Muriate and Sulphate of Potash for Agriculture.

PRODUCERS OF—

BORAX	**BROMINE**
POTASH	**CHLORATES**
SODA ASH	**PERCHLORATES**
SALT CAKE	**MANGANESE DIOXIDE**
LITHIUM	

—and a diversified line of specialized agricultural and refrigerant chemicals

MURIATE of POTASH, agricultural grades 95-98% KCL, (60% K_2O minimum), regular and granular.
SULPHATE of POTASH, agricultural grade, 95-98% K_2SO_4 (51% K_2O minimum).

TRONA

American Potash & Chemical Corporation

Offices • 3030 West Sixth Street, Los Angeles 54, California
99 Park Avenue, New York 16, New York
214 Walton Building, Atlanta 3, Georgia

Plants • Trona and Los Angeles, California; Henderson, Nevada
San Antonio, Texas (American Lithium Chemicals, Inc.)

Export Division • 99 Park Avenue, New York 16, New York

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PHOSPHATES

YOUR PHOSPHATE
IS ANALYZED 5 TIMES BEFORE SHIPMENT

Careful testing of your phosphate at every stage of production—washing, blending, drying, grinding and loading—is one of the factors in *International's* quality control that assures uniformity of grade to exact specifications. Your phosphate is sampled and tested in our analytical laboratory at least five times before shipment. Blending grades to your special requirements is simple routine because of our large tonnage and the flexibility of our modern production facilities. When you depend on *International* for phosphates, our great team of mining, production and service people sees to it that you get exactly what you order, in the tonnage you need, when you want it. That's what quality control means.

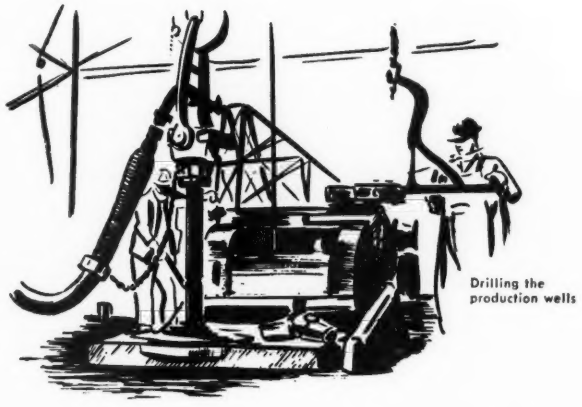
FOR INDUSTRY
AND AGRICULTURE

- for the manufacture of complete fertilizers.
- for the manufacture of industrial chemicals.
- ground rock phosphate for direct application to the soil.

PHOSPHATE MINERALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

GENERAL OFFICES: 20 N. WACKER DR., CHICAGO 6 • Phosphate Mines and Plants in Florida at Noralyn, Peace Valley



Drilling the production wells

Crude Sulphur

for Industrial Use

from the properties of

Texas Gulf Sulphur Co.

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Producing Units

- **NEWGULF, TEXAS**
- **MOSS BLUFF, TEXAS**
- **SPINDLETOP, TEXAS**
- **WORLAND, WYOMING**

GOVERNMENT

USDA Soils, Fert, Committee Meets

At its annual meeting held in January at Riverside, Calif., the USDA advisory committee on soils, water and fertilizer research cited needs for study of improved methods for fertilizer quality control, new research in watershed hydrology and in soil structure and expanded studies of moisture conservation in both arid and humid regions.

The group concluded that procedures to secure more nearly standard fertilizer-quality controls throughout the country can best be developed by the Federal government. It was also recommended that liquid mixed fertilizer formulations be studied to determine what materials are compatible, ways of incorporating minor elements, prevention of potash salting-out and economic methods for using wet-process phosphoric acid in formulation.

Ricegrowers Vote Approval of Quotas

In a January 27 referendum, 84.8 per cent of 10,430 ricegrowers voted approval of marketing quotas for the 1956 crop. In only two of the major rice growing states, California and Missouri, a majority voted against the quotas.

USDA Urges Cut in Potato Acerage

USDA has recommended an average cut of eight per cent in total acreage of summer and late potatoes. In view of relatively stable annual requirements for potatoes and the upward trend in average yields, growers are urged to hold the line on acreage this year and, in many larger production areas, to cut back from the 1955 level.

ICA Authorizations

Philippines. $280,000—agricultural pesticides (PIO/C No. 92-51-013-5-60079). Source: USA & possessions. Terminal delivery date: 3/15/56. Procurement through Emerg. Proc. Service, GSA.

The Republic of Korea. $17,320,000 fertilizers (PA No. 89-99-A6-6009). Includes nitrogenous fertilizer, $10,220,000; potash fertilizer, $450,000 and phosphatic fertilizer, $6,650,000.

Contract period: 2/2/56–5/31/56. Source: world wide. Terminal delivery date: 7/31/56. Barter provision: in case of tie bids, other conditions equal, awards will be made to bidders having barter agreements with the Commodity Credit Corp.

Thailand. $202,000—agricultural pesticides (PIO/C No. 93-51-017-5-69010). Source: USA & possessions. Terminal delivery date: 1/3 of DDT to be delivered in Bangkok by March 31 and balance by September 30, 1956; dieldrin to be delivered in Bangkok by March 31. Procurement through Emerg. Proc. Service, GSA.

Vietnam. $195,000—nitrogenous fertilizer (PIO/C No. 30-82-075-5-60132.1); $185,000—phosphatic fertilizers (PIO/C No. 30-82-075-5-60132.2); $70,000—potash fertilizer (PIO/C No. 30-82-075-5-60132.3). Source: nitrogen and potash, USA & possessions; phosphates, USA & possessions, North Africa. Terminal delivery date: May 30, 1956. Procurement through Emerg. Proc. Service, GSA.

'56 Support Levels Released by USDA

This year's minimum price support rates for crop corn will be based on $1.40 per bushel, 81 per cent of January 15 parity price. Rates in noncommercial producing areas will be at 75 per cent of commercial area support rates as required by law when corn acreage allotments are in effect in commercial areas.

Acreage allotments for the commercial area announced on February 1 totaled 43,280,697 acres, a decrease of 15 per cent from 1955.

Other support levels announced by USDA include: soybeans, national average price of $2.15 per bushel, 75 per cent of January 15 parity price; cottonseed, about 70 per cent of January 15 parity price of $69.40 per ton average quality seed; and flaxseed, national average price of $3.09 per bushel, 70 per cent of January 15 parity.

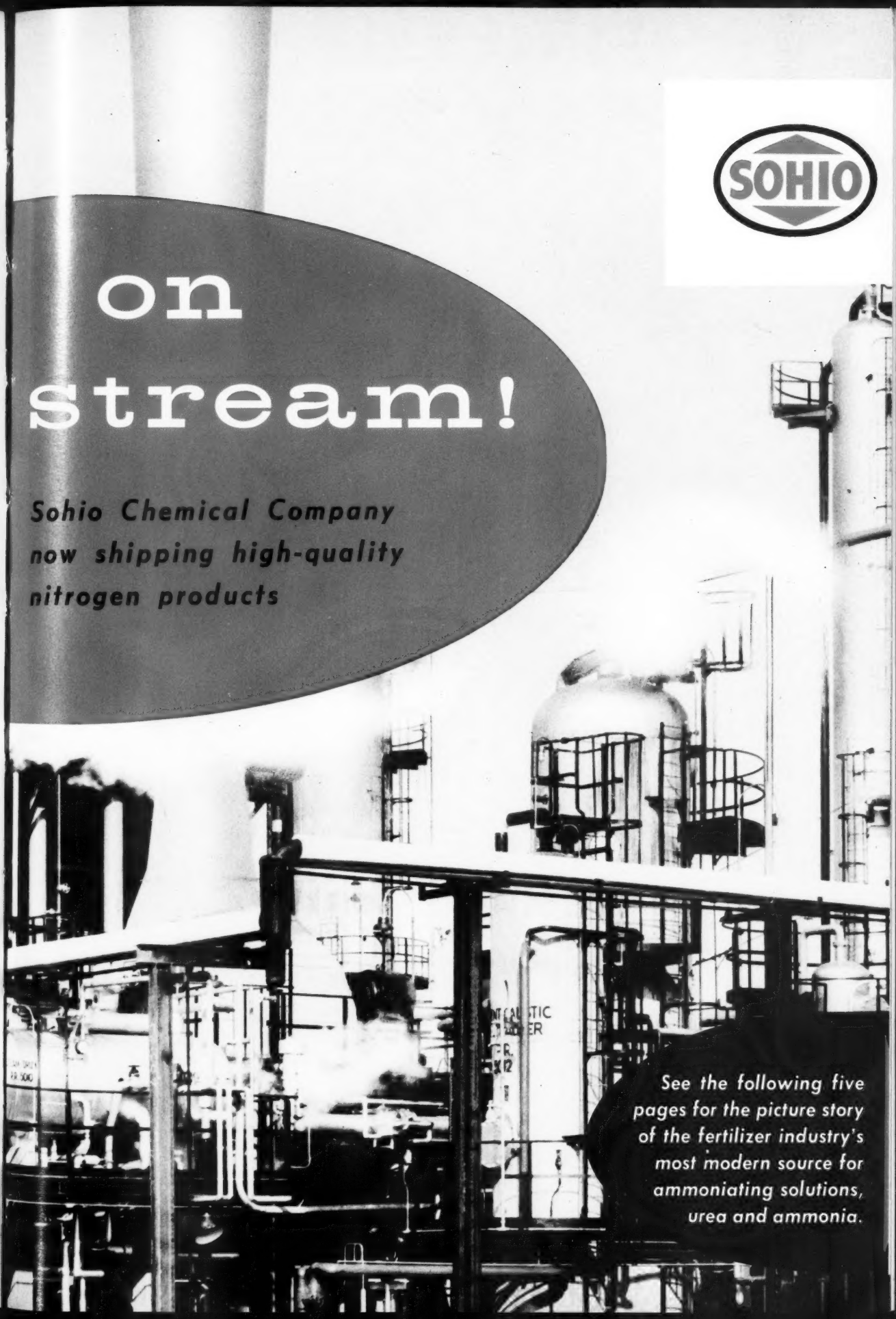
McLain Succeeds McConnell in USDA

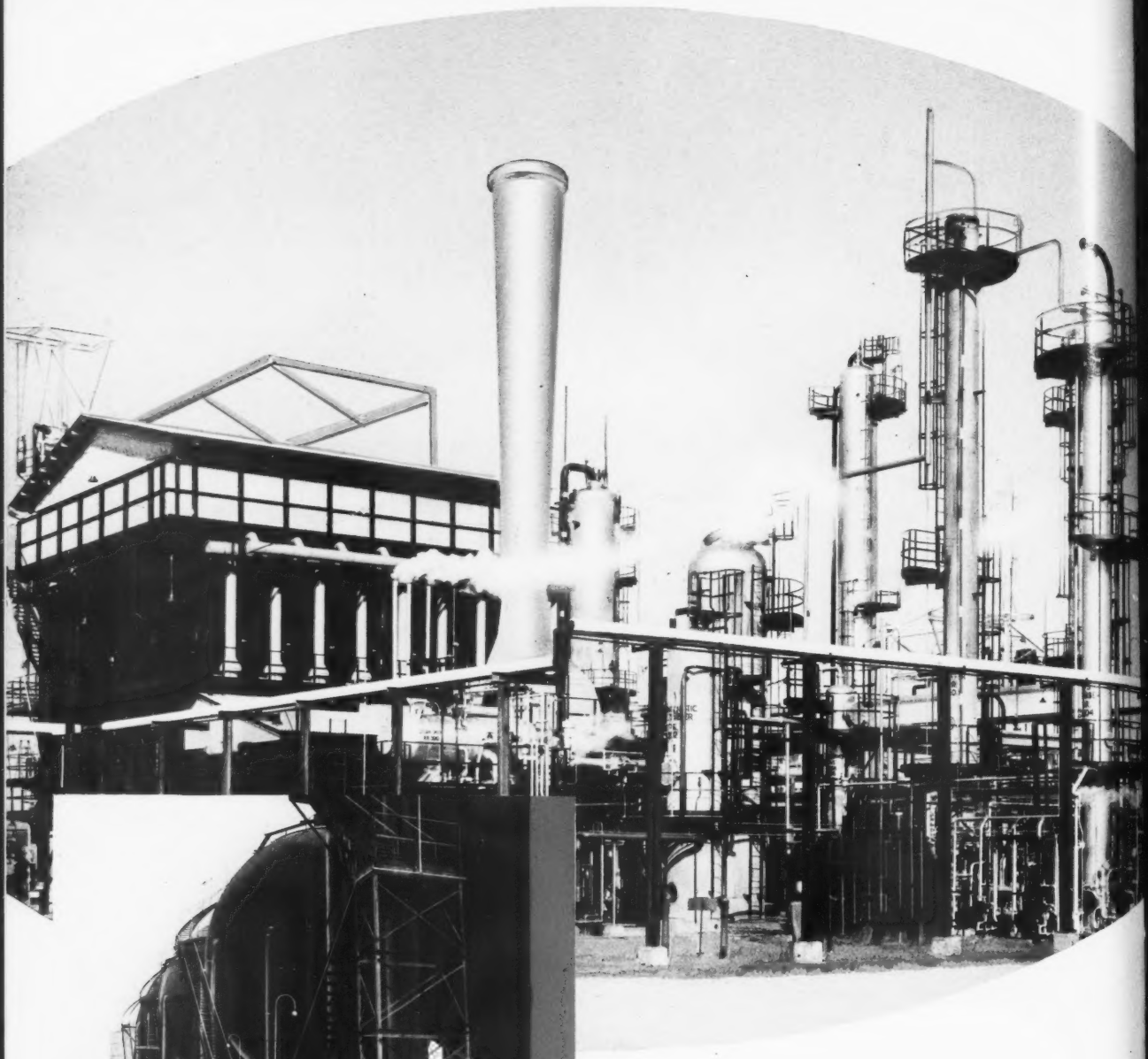
Marvin L. McLain has been named assistant secretary of agriculture for agricultural stabilization succeeding James A. McConnell who resigned on December 24. A native of Iowa, McLain has served as director of the grain division of CSS since August, 1953.

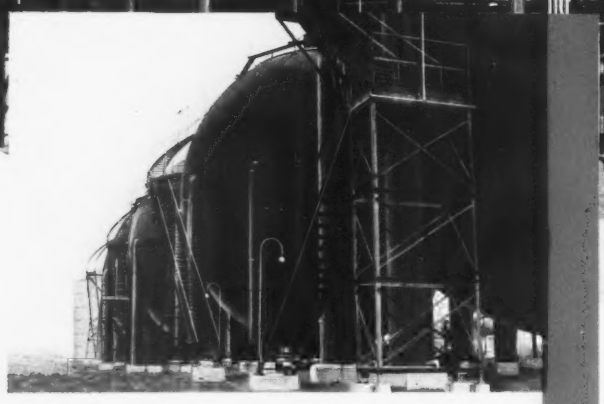
Lloyd N. Case succeeds McLain in the grain division.

Animal Pest Unit Headed by Johnson

Appointment of Dr. Howard W. Johnson as chief of the Animal Disease and Parasite Research Branch of USDA's Agricultural Research Service has been announced. Johnson served as acting chief since September 1.


SOHIO
on stream!
Sohio Chemical Company now shipping high-quality nitrogen products
See the following five pages for the picture story of the fertilizer industry's most modern source for ammoniating solutions, urea and ammonia.





Ample anhydrous ammonia storage more than assures deliveries during peak demand periods.

Largest storage facilities in country in relation to production capacity.

DRAWING on the best available experience in the chemical industry, Sohio surveyed every known method of ammonia and urea production. Selecting the most reliable of processes to produce the highest quality product, the ultimate in a modern petrochemical plant was designed. No effort, no expense was spared. Users of nitrogen chemicals were questioned as to their product and delivery needs. Research and production departments were staffed with outstanding men. The new Sohio Chemical plant at Lima is as perfect as men and materials can make it.

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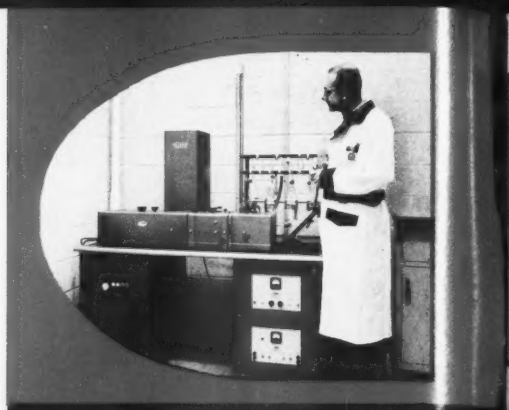
Electronic Quality Control

pays dividends to Sohio customers

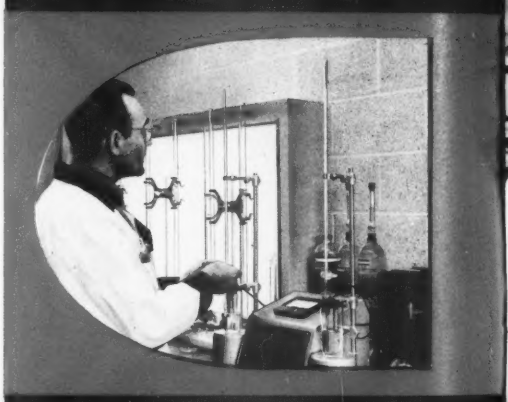
New electronic methods — unique systems never before used in this industry — maintain quality and production control at Sohio Chemical Company. Every phase of ammonia production is electronically scanned five times each minute and recorded by the Data Logger, an instrument originally perfected for the Atomic Energy Commission. Production and quality conditions are recapped hourly by the Data Logger and transmitted to IBM cards for continuing analysis by an "electronic brain." This assures uninterrupted quality production. Pictured here are other quality checks that continuously safeguard quality.

Sohio's all-new fleet of aluminum solutions tank cars and high pressure steel anhydrous ammonia tank cars are ready to serve you. These cars and the tank trucks are equipped with the most modern devices including spring-loaded relief valves to meet your requirements for safer, quicker, more economical service.



Infra-red Spectrophotometer analyzes the various process gas streams.

Kjeldahl rack used in determining nitrogen content of materials to make quantitative analysis.



Standardizing titration solutions for finished product analysis with the Titrometer.

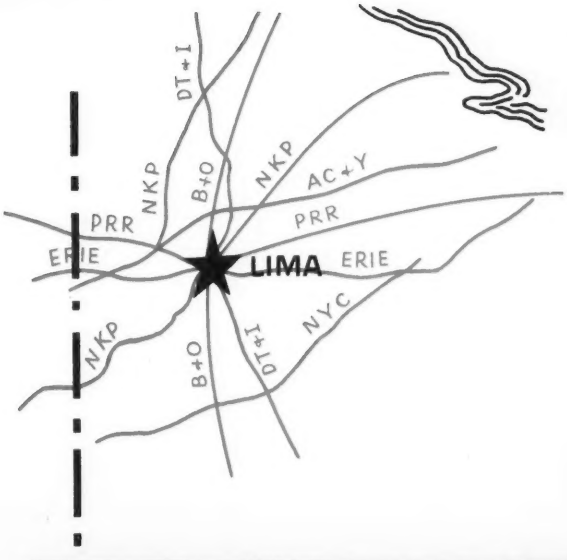
Sartorius Balance is a high-speed instrument capable of accurately weighing analytical samples.

Mass Spectometer performs rapid and graphic electronic analysis of the process gases.

fast service

unmatched facilities

uniform high quality



Centrally located in America's agricultural heartland, Sohio's Lima plant is served by five railroads:

NICKEL PLATE **BALTIMORE & OHIO** **ERIE**
PENNSYLVANIA **DETROIT, TOLEDO & IRONTON**

These lines offer ready transfer to connecting roads. In addition, two of them provide switching service inside the plant area, assuring rapid rail service from Sohio's plant.

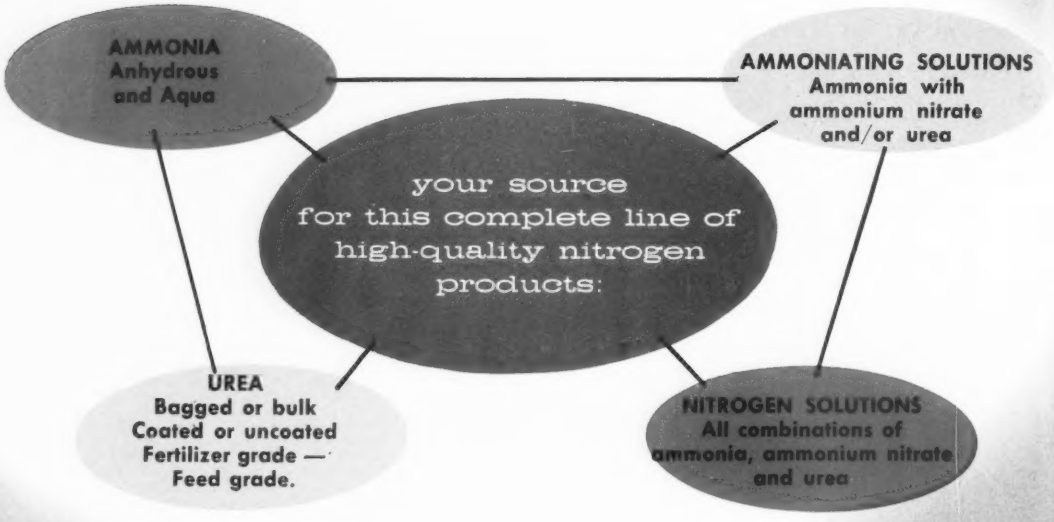
- Equipment and methods are the most modern among the thoroughly tested and proven processes.
- There is adequate provision for expansion.
- Uninterrupted operation is assured by multiple sources for natural gas, water, electrical power.
- Downtime is minimized because of Sohio's integrated maintenance system.

One of the most important requisites for a plant in this market is its ability to meet extraordinary delivery requirements. Sohio's shipping and storage facilities are geared to these needs. For example, rail car loading capacity is *four* times productive capacity. In addition, Sohio's own trucks are ready to ship on relatively short notice. And no other producer offers a more complete line of ammoniation products.

New aluminum 5200-gallon solutions and 6800-gallon steel anhydrous ammonia tank trucks furnish regular delivery service within normal trucking area and twenty-four hour emergency service throughout distribution area. Excellent road facilities to all points.

Sohio provides GUARANTEED ANALYSIS of each batch

Every tank car, every tank truck is checked before it is released to Sohio customers. This is your assurance of maintaining the quality of your own product.



TECHNICAL SERVICE AVAILABLE

- Capable technicians, engineers and agronomists ready to serve you.
- Outstanding laboratory with staff experienced in chemical research and manufacturing problems.
- Qualified independent research organizations with specialized facilities are on call when required.

WE'RE ON STREAM, READY TO SERVE YOU

- Sales representatives will be happy to make a personal call at your plant and discuss formulation and materials best suited to your individual needs.
- Our complete facilities are at your disposal, ready to serve you during the coming season. We will be pleased to have the opportunity to earn your confidence as a dependable supplier.

SOHIO

SOHIO CHEMICAL COMPANY

P. O. BOX 628

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Chemicals

67—Escambia Bay Data

A beautiful booklet, printed in color tells the story of Escambia Bay Chemical Corp., its facilities, products and personnel. The plant itself is described and pictured, process by process, on a pull-out insert. For a copy

CIRCLE 67 ON SERVICE CARD

68-70—Manganese Compounds

To help boost your sales through addition of trace element compounds, Tennessee Corp. offers nutritional manganese materials. Manganese sulfate is designed for use in mixed goods or for direct soil application, Nu-M for direct foliar application as spray or dust or combined with pesticides and manganous oxide—Nu-Manese—for mixing, foliar or soil application and animal feeds. For literature on any of these compounds, circle the appropriate number:

CIRCLE

68 Manganese sulfate

69 Nu-M (neutral, finely divided form)

70—Nu-Manese (manganous oxide)

71—Sohigro Urea

This urea fertilizer compound, 45 per cent nitrogen, is available in prilled form packed in 80 lb. bags. You help customers boost yields and income with this organic nitrogen source. As an example of sales appeal, Sohio says that one application "can feed a 100-bushel corn crop with nitrogen for life." If you're interested in handling this product

CIRCLE 71 ON SERVICE CARD

72—Nitrolime & Cal-Nitro

Both of these non-acid forming nitrogen sources offer 20.5 per cent nitrogen, half in nitrate form and half as ammonia nitrogen. Balanced for fast action and resistance to leaching, they are granulated for easy application. Bradley & Baker points out that your sales will be enhanced by a top merchandising program of sample displays, local advertising, radio spots and other aids. For complete details

CIRCLE 72 ON SERVICE CARD

73—Nitro-Form

With this material, says Nitroform Agr. Chem. Div., you can mix a highly competitive product without a cost increase. Containing 38 per cent nitrogen it is available over a long period, feeding nitrogen evenly and safely. For information

CIRCLE 73 ON SERVICE CARD

FREE INFORMATION to help you solve fertilizer, pesticide problems

Reader Service

74-77—Horse & Lion Nitrogen

A variety of nitrogen fertilizers to very many requirements are available from Atkins, Kroll & Co. under the Horse & Lion brand. Circle the appropriate number for the information and prices on the material in which you are interested.

CIRCLE

74—Calcium Nitrate (15½% N, granulated)

75—Calc. Ammon. (20½% N, granulated)

76—Ammon. Sulfate Nitrate (26½% N, granulated)

77—Urea (46% N, pelleted without coating)

How to use the READER SERVICE CARD

- **Circle number of literature you want.**
- **Print or type your name, position, company and address.**
- **Clip and mail the Service Card.**

78—Heat-Dried Sludge

Circle this item if you're interested in city of Baltimore heat-dried sludge. Termed a good low-cost organic conditioner, it is available in bulk car or truck lots through H. J. Baker. For information

CIRCLE 78 ON SERVICE CARD

79—Sequestrene Bibliography

A Sequestrene Bibliography (1953-54) has been issued by Geigy Industrial Chemicals. Included is a large number of references on both agricultural and industrial aspects. For a copy

CIRCLE 79 ON SERVICE CARD

80—Perma Green Iron 35

This organic chelate from Refined Products has been used successfully on a variety of crops including citrus, vegetable and ornamental species. Where leaves have yellowed due to iron deficiencies the comapny says Perma Green Iron 135 will give a dark green color in two weeks' time. It can be used as a solid or in nutrient solutions. For detailed information

CIRCLE 80 ON SERVICE CARD

81—Pyrocide Dusts

McLaughlin Gormley King has issued a comprehensive guide to its non-toxic and low residue insecticide concentrates, Pyrocide dust and P-M dust. Of special interest to all formulators of agricultural pesticides, it includes data on storage, handling, diluents or carriers, compatibility, mixing and sifting, packing and storing, labeling, registration and selling points. If you and your customers are concerned about meeting Miller Bill requirements, these materials may be the answer. To get a copy, formulators only

CIRCLE 81 ON SERVICE CARD

82—New Attaclay Folder

The latest issue of ATTACLAY PESTICIDE DIGEST is devoted to granular pesticides and their application in control of European corn borer. Specialized field application rigs are illustrated and various mesh classifications are shown in actual size. For a free copy

CIRCLE 82 ON SERVICE CARD

83—"Esters by Glyco"

This 1956 catalog from Glyco Products describes fatty acid esters of glycerol, glycols and polyethylene glycols. Included are tables of physical and chemical products of these non-ionic surface active agents. For a copy

CIRCLE 83 ON SERVICE CARD

Process Equipt.

84—RTR Insecticide Plants

Top production capacity in a limited floor area is a big advantage with Poulsen's Ready-to-Run insecticide plants. Two to four 1200–1500 lb. batches of dust concentrate per hour or six to eight batches of field strength dust are delivered by the dual 40 cu. ft. model. A standard model has the same capacity of field strength dusts and both types are also available in 56 cu. ft. size. The plants are factory tested and can be placed in production only two days after delivery. For technical bulletins on these and liquid toxicant formulating plants, use the ad coupon on page 9 or

CIRCLE 84 ON SERVICE CARD

85—Turn-Key Service

Six-point turn-key service is featured by Link-Belt in its responsibility for design, equipment and erection of fertilizer plants. From laboratories with complete testing equipment to skilled erection crews, the L-B service assures satisfactory mechanical performance. For a 16-page book on plants and equipment for the industry

CIRCLE 85 ON SERVICE CARD

86—Perma-Plate Magnets

Full description of Dinges non-electric Alnico Perma-Plate magnets is provided in a new catalog. It illustrates the four basic types which incorporate a brand-new concept of tramp iron removal. Diagrams show applications for use with chutes, ducts, conveyor belts or slides.

CIRCLE 86 ON SERVICE CARD

87—Mikro-Multi-D

Pulverizing Machinery's Mikro-Multi-D is a new pulverizer especially designed for use where product purity is of top importance.

It gives close particle control in the four to 20 mesh range and can be easily assembled or disassembled to permit quick changes from one product to another. For a bulletin and test data check

CIRCLE 87 ON SERVICE CARD

88—Automatic Weight Units

Class 36 automatic heavy duty bulk scales produced by Richardson Scale are designed to handle dry, ground, granular, dust and non-free flowing materials. The company reports that materials effectively handled includes bone meal, calcium nitrate, fertilizer, fish meal, insecticides, limestone, ground phosphate rock, pyrethrum flowers, sodium nitrate and sulfur. A bulletin discusses construction, operation, feeding arrangements, capacities, etc., and special features of the Class 38. For a copy

CIRCLE 88 ON SERVICE CARD

89—Centrifugal Blowers

Complete technical specifications on the IPF line of un-plasticized rigid polyvinyl chloride blowers are contained in a new 20-page booklet. Designed for expelling corrosive air fumes and gases, the units are built to withstand most chemical fumes and polluted air in a temperature range of 40 to 140° F. The booklet includes performance tables on all models and chemical resistance charts.

CIRCLE 89 ON SERVICE CARD

90—TL-6 TractoLoader

Fully loaded buckets are assured through the hydraulic torque converter on the Tractomotive TL-6 TractoLoader Operation is easy—no gears, just a lever to change direction. Compact design and a 6½ foot turning radius aid in working box-cars or traveling in restricted areas. The bucket has a 50° tip-back at only three feet above the floor. For a catalog, use the coupon on page 17 or

CIRCLE 90 ON SERVICE CARD

Packaging

91—Checkweighing

Exact Weight offers a high speed scale termed ideal for production weighing or accurate checkweighing of bags from automatic sackers. With visible dial indication for positive reading, short lever movement and hydraulic dashpot action brings the indicator to rest quickly. It has a capacity of 150 lbs. and can be furnished with vertical or slant tower. For complete information

CIRCLE 91 ON SERVICE CARD

Materials Handling

92—Chief Bulk Transport

For faster more flexible delivery of bulk fertilizers, Henderson Manufacturing recomends its Chief Bulk Transport body. Hydra-Mech power permits one-man operation of feed gate, elevator and floor panels from one position at the rear of the unit. For a folder on this self-unloading transport

CIRCLE 92 ON SERVICE CARD

93—Towmotor Brochures

Three 4-page brochures have been issued by Towmotor, covering its entire line of fork lift trucks, tractors and accessories. Standard specifications are provided on all fork lift truck models in one folder; the others cover both standard accessories and custom engineered equipment, designed to meet specific applications. For copies

CIRCLE 93 ON SERVICE CARD

Application

94—Krause Applicators

A new price list is now available covering Krause liquid fertilizer trailer applicators and the Krause-Liberty hose pump. The firm has also reprinted a report by a USDA engineer covering development and characteristics of the pump. For copies

CIRCLE 94 ON SERVICE CARD

95—Transland Airfoil Spreader

A 35 per cent increase in dust flow with this unit is reported, based on flight tests spreading 50 lbs. of dust. The spreader has an airfoil shaped nose and gate for maximum venturi air pressure and dust flow. It is a split type with internal vanes for smooth air flow and uniform swath width and is of all aluminum construction. For further details

CIRCLE 95 ON SERVICE CARD

Miscellaneous

96—Know Your Soils

With the Simplex line of soil testers you can do your own soil testing for customers—the results can lead to greater sales and profits. Available in complete, farm and junior kits, the testers are based on methods devised at Michigan State College. For more information

CIRCLE 96 ON SERVICE CARD

97—Humidity & Temp. Recorders

Portable recorders for relative humidity and temperature produced by Bristol are described and illustrated in a new bulletin. Samples of typical records made by the units are shown along with permanent mounting models.

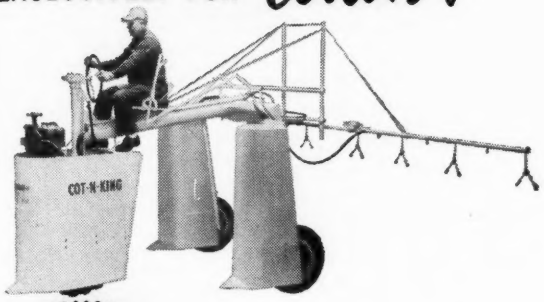
CIRCLE 97 ON SERVICE CARD

See pages 66 and 67 for information on these Reader Service numbers—

99—L-B Idler
100—Hewitt-Robins Screen
101—Gardner Sampler
102—Power-Curve Loader
103—Level Indicator

Now for the first time

A HIGH CLEARANCE SPRAYER DESIGNED EXCLUSIVELY FOR *Cotton!*



The NEW

Finco

COT-N-KING

insures your cotton profit from planting to picking

- High clearance...up to 6½ feet boom clearance.
- Four-speed transmission.
- Choice of engines—8 HP or 14 HP.
- Adjustable boom.
- All controls within reach of driver.
- Heavy weight tubular construction.
- Choice of spray nozzles.
- Proven units—oldest high clearance manufacturer.
- Adjustable row spacings—36", 38", 40", 42".
- Cotton fenders on all wheels and tanks.
- Larger front-drive wheel.
- Full left or right 90° steering.
- Proven gear pump and pressure regulator.
- Tanks on both rear wheels for perfect balance.

Not a redesign or adaptation...but an all new, especially engineered unit, developed to meet the specific needs of cotton growers.

Finco, Inc., one of the country's oldest and largest manufacturers of high clearance sprayers spent months of careful field research with cotton growers, chemical makers, custom sprayers and U.S.D.A. representatives...then designed the COT-N-KING to meet their exacting needs...encompassing operating speed and efficiency, rugged construction, maximum safety, reduced maintenance, and low initial costs.

WRITE TODAY FOR FREE BROCHURE

***Finco* COT-N-KING**

SELF-PROPELLED, HIGH CLEARANCE SPRAYER

Produced in the cotton belt

FINCO, Inc.
Box 575, Greenville 5, Miss.

Please send me complete information on your new, field-proved COT-N-KING.

☐ I am a cotton grower
☐ I am a custom sprayer
☐ I am interested in a dealership

*Name*_____

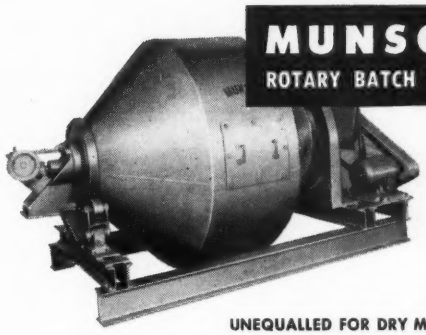
*Address*_____

*City*_____ *Zone*___ *State*_____

For faster, more accurate blending of dry ingredients...

...make it a

MUNSON
ROTARY BATCH MIXER



UNEQUALLED FOR DRY MIXING OF:

- CHEMICALS
- FEEDS
- INSECTICIDES
- FERTILIZERS
- GLUE
- CEREALS
- GELATIN
- OTHER DRY INGREDIENTS

You can mix it better and faster in a Munson ... the Rotary Batch Mixer with the **tumbling action** for intimate blending of dry ingredients.

Its famous 7-way mixing action assures extreme accuracy of blend, without grinding or reducing size of ingredient particles.

Munson Rotary Batch Mixers are available in capacities from 20 to 250 cu. ft. The basic Munson design can be altered to fit **your** individual requirements. Can be fitted with internal spray for introduction of limited amount of liquid.

Lower horsepower requirements and low operating costs have made Munson the **first choice** for performance and economy in hundreds of different applications. Let our engineers help solve **your** mixing problems.

Other famous MUNSON products: Rotary Knife Cutters, Hammer Mills (25 to 100 H.P.), Attrition Mills (24" to 30"), Rotary Crushers.

NO OTHER MIXER HAS THIS MULTIPLE-BLENDING ACTION!

Lifters on inside of truncated cone ends continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock.

Write today for complete details

Munson Mill Machinery Company

DEPT. FC-356, UTICA, NEW YORK

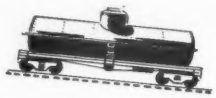
A
Winning Hand . . .

5 PHILLIPS
Fertilizer
Materials for
High
Analysis
Mixtures

1 Ammonium Sulfate

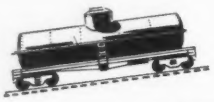
New Premium Quality Phillips *66* Ammonium Sulfate contains 21% nitrogen, 23.8% sulfur. It is *dry*-cured to remove excess moisture, prevent caking. Uniform dust-free crystals flow freely, mix easily. Ideal for all analyses of mixed goods and for direct application. Available in bags or bulk.

2 Anhydrous Ammonia



Phillips *66* Agricultural Ammonia contains 82% nitrogen. It's a convenient, economical source of nitrogen for formulation. Tank car shipments are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle and at Adams Terminal near Houston, Texas.

3 Nitrogen Solutions

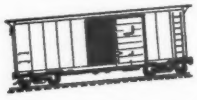


Get more N per dollar! There are three Phillips *66* Nitrogen Solutions for use in preparation of high-analysis fertilizers and the ammoniation of superphosphate. These solutions keep handling costs low; help rapid, thorough curing.

4 Ammonium Nitrate

Phillips *66* Prilled Ammonium Nitrate contains 33.5% nitrogen. The small, coated prills or pellets resist caking, handle easily. Depend on Phillips *66* Prilled Ammonium Nitrate for uniform free-flowing properties in formulations and top-notch crop response as a direct application material.

5 Triple Superphosphate



Phillips *66* Triple Superphosphate contains 46% available phosphoric acid. Ideal for use in formulation of high-analysis fertilizers.

Phillips 66

PHILLIPS CHEMICAL COMPANY

A Subsidiary of Phillips Petroleum Company, Bartlesville, Oklahoma

Offices in:

AMARILLO, TEX.—*First Nat'l Bank Bldg.*
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CHICAGO, ILL.—*7 South Dearborn St.*
DENVER, COLO.—*1375 Kearney Ave.*
DES MOINES, IOWA—*606 Hubbell Bldg.*
HOUSTON, TEX.—*1020 E. Holcombe Blvd.*
INDIANAPOLIS, IND.—*1112 N. Pennsylvania St.*
KANSAS CITY, MO.—*500 West 39th St.*
MINNEAPOLIS, MINN.—*212 Sixth St. South*
NEW YORK, N. Y.—*80 Broadway*
OMAHA, NEB.—*WOW Building*
PASADENA, CALIF.—*604 Citizens Bank Bldg.*
RALEIGH, N. C.—*804 St. Mary's Ave.*
SALT LAKE CITY, UTAH—*68 South Main*
SPOKANE, WASH.—*521 E. Sprague Ave.*
ST. LOUIS, MO.—*4251 Lindell Blvd.*
TAMPA, FLA.—*1214 South Dale Mabry*
TULSA, OKLA.—*1708 Utica Square*
WICHITA, KAN.—*501 KFH Building*

Associations & Meetings

Calif. Fert. Conf. Planned for April

The Fourth Annual California Fertilizer Conference is scheduled for April 16 and 17 on the campus of the Citrus Experiment Station, University of California, Riverside.

Sponsored by the California Fertilizer Association's Soil Improvement Committee, the program is now being developed to interest fertilizer manufacturers, salesmen and dealers, farm organizations, USDA, research and college personnel.

For a copy of the program, write to CFA, 475 Huntington Drive, San Marino.

PNPFA Dealer Day Successful

The Pacific Northwest Plant Food Association reports that its Fertilizer Dealer Day held at Corvallis, Ore., on January 18 was a distinct success from the standpoint of number of dealers attending. About 150 persons were present, at least half of whom were dealers. From the many questions asked from the floor, interest in the program was indicated.

Plans are progressing for the fertilizer conference to be held June 28–30, according to the group's secretary, Leon Jackson. Meetings and the banquet will be held at the Chinook Hotel, Yakima.

CFA Makes Fert. Research Grant

M. E. McCollam, chairman of the California Fertilizer Association's Soil Improvement committee, reports that $4,000 has been set aside as the nucleus for a fund to provide for addition of 24 lysimeters to the controlled research project at the Citrus Experiment Station, University of California, Riverside. Entire cost of the project will be about $12,000, and it is hoped that the committee action will prompt other interests which will benefit to subscribe the balance of the needed funds.

Comp. Gas Assn. Elects Officers

Officers recently elected by the Compressed Gas Association include M. L. Griffin, Shell Chemical Corp., president; J. W. Dunham, National Cylinder Gas Co., and A. R. Olson, Suburban Propane Gas Corp., vice presidents; and F. R. Fetherston, secretary-treasurer.

Collins Heads SAACI

E. L. Collins has been named president of the Salesmen's Assn. of the American Chemical Industry.

APS N. Central Meet Scheduled

Investigations on cereal diseases will be featured on the program for the American Phytopathological Society's north central division summer meeting on June 5 and 6 at Manhattan, Kans. Also to be discussed are stone fruit viruses, sweet potato investigations and forage crop diseases.

CACA to Set Up Own PR Program

It is reported that the Canadian Agricultural Chemicals Association is making arrangements to handle its own public relations functions. Since its organization, two years ago, the group has been making use of equipment and facilities of the Canadian Paint, Varnish and Lacquer Association.

ICI Wisc. Ent. Scholarship

A $150 scholarship was awarded Walter S. Bigley, a junior in Entomology at the University of Wisconsin, by the Insect Control Industries during the insect control conference held in Madison on January 11 and 12. He is shown receiving the award from Associate Dean V. E. Kivlin of the Wisconsin College of Agriculture. Watching are Prof. C. L. Fluke, Dept. of Entomology; J. D. Hopkins, Hopkins Agricultural Chemical Co., chairman of the scholarship committee; H. H. Harris, McConnon Co.; and Alfred Weed, John Powell Div., Olin Mathieson Chemical Corp.

Don't Let This Happen To You!

The filly-loo bird above didn't realize the value of a

- non-burning
- long lasting
- non-leaching
- economical

38% Urea-Form Nitrogen in his formula.

NITRO-FORM

Division of Woonsocket Color & Chemical Co.
WOONSOCKET, R. I.

SOLE SELLING AGENT:
H. J. BAKER & BRO.
600 FIFTH AVENUE
NEW YORK 20, N. Y.

Escambia Bay, J & L Steel Join MCA

Escambia Bay Chemical Corp. and Jones & Laughlin Steel Corp. have joined the Manufacturing Chemists' Association, MCA reports.

Quinn Heads New CFA Info Group

Information on the value of proper fertilization will soon be made available to bankers, other loan agencies, and their farm clients through the activities of a new California Fertilizer Association committee. The group will present data developed by the University of California, the fertilizer industry and other authoritative sources.

James M. Quinn, California Sun Fertilizer Co., has been named chairman and is assisted by B. H. Jones, Sunland Industries, Inc.; Wilson Meyer, Wilson & Geo. Meyer & Co.; A. W. Mohr, California Spray-Chemical Corp.; Geo. Monkhouse, Shell Chemical Corp.; and David Williamson, Balfour, Guthrie & Co.

The committee has the active cooperation of the National Plant Food Institute.

Public demand for CFA's WESTERN FERTILIZER HANDBOOK will necessitate publication of a third edition in advance of original plans, reports Earle J. Shaw, chairman of the Handbook Sub-Committee.

New MCA Benzene Safety Data Sheet

A revised safety data sheet on benzene, giving properties and essential information for the safe handling and use of benzene, has been published by the Manufacturing Chemists' Association.

Copies of the 20-page booklet are available from MCA, 1625 Eye St., NW, Washington 6, D. C., at 30 cents each.

Calendar

March 6-7. Western Cotton Production conf., Fresno Hacienda, Fresno, Calif.

March 14-16. National Agric'l Chemicals Assn., spring meeting, Hollywood Beach Hotel, Hollywood, Fla.

March 28-30. North Central Branch, ESA, Purdue Memorial Union, Lafayette, Ind.

April 10-12. 21st annual conf. of Council for Agricultural and Chemurgic Research, Congress Hotel, Chicago.

April 11-12. Insect and Rodent Control Conf. for Sanitarians, Purdue University, Lafayette, Ind.

April 16-17. Calif. Fertilizer Conference, sponsored by CFA's Soil Improvement Committee. Citrus Experiment Sta. University of California, Riverside.

May 16-18. Synthetic Organic Chemical Manufacturers Assn. annual outing, Skytop, Pa.

May 20-22. Chemical Specialties Mfrs. Assn. mid-year meeting, Drake Hotel, Chicago, Ill.

June 5-6. American Phytopathological Society, North Central Div., summer meeting, Kansas State College, Manhattan.

June 10-11. National Plant Food Institute Convention. The Greenbrier, White Sulphur Springs, Va.

June 28-30. Assn. of Southern Feed & Fertilizer Control Officials Convention, Hotel Roanoke, Roanoke, Va.

June 28-30. Pacific NW Plant Food Assn. Fertilizer Conference, Chinook Hotel, Yakima, Wash.

July 12. Annual S. C. Fertilizer meeting and tour, Edisto Exp. Sta., Blackville, S. C.

July 19-20. Southwestern Fertilizer Conference and Grade Hearing, Buccaneer Hotel, Galveston, Tex.

July 25-27. NW Assn. of Horticulturists, Entomologists & Plant Pathologists Conf., Northwest Wash. Experiment Sta., Mt. Vernon, Wash.

Aug. 17-25. Tenth International Congress of Entomology, McGill University & Univ. of Montreal, Montreal, Canada.

NOW ON STREAM!

Escambia Bay Chemical Corporation, Pensacola, Florida — the only plant of its type on the Gulf Coast, east of New Orleans!

NOW PRODUCING A CONTINUOUS SUPPLY OF ANHYDROUS AMMONIA, NITRIC ACID, BAY-SOL NITROGEN SOLUTIONS, AND—

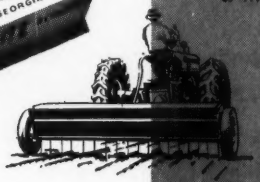
AMMO-NITE

AMMONIUM NITRATE FERTILIZER

Containing 33.5% Nitrogen

GROW IT RIGHT with
AMMO-NITE
AMMONIUM NITRATE FERTILIZER
Containing 90% or more Ammonium Nitrate with no Organic Coating
33.5% NITROGEN
NET WEIGHT 100 POUNDS
MANUFACTURED BY ESCAMBIA BAY CHEMICAL CORP. PENSACOLA, FLORIDA
DISTRIBUTED BY ASHCRAFT-WILKINSON CO. ATLANTA GEORGIA

Sell AMMO-NITE . . . and you can offer your customers *more* Nitrogen for *less* money than other plant food forms. Simple arithmetic proves it! More Nitrogen in every bag means less bulk and weight for you and your customers. Uniform AMMO-NITE prills flow freely, spread evenly — never clog or stick in the spreader. AMMO-NITE leaches far less, too! New *stay-dry* bags keep AMMO-NITE in perfect condition in any weather. Order now. *It's a money-maker!*



GROW IT RIGHT WITH AMMO-NITE!

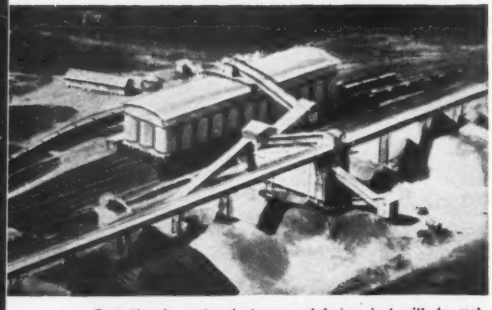
Products of the Escambia Bay Chemical Corporation, Pensacola, Florida, are distributed exclusively by

ASHCRAFT-WILKINSON COMPANY, Atlanta, Georgia

Three of the A.A.C. Co's electrically-operated draglines at work at our phosphate mines in Central Florida. Bucket capacities range from 9½ to 17 cubic yards. The 17-yard draglines with their 175-foot booms each weigh more than a million and a half pounds and can move 35,000 tons of material in 24 hours. From these rock deposits flow a continuous stream of high quality phosphate rock, assuring a dependable source of supply of AA QUALITY phosphorus products, see list below.

AA Quality...

for over 85 years a symbol of quality and reliability



From the air—wet rock storage and drying plant, with dry rock storage silos in background. These silos, 29 in number, have a total capacity of 40,000 tons of dried rock. Under the silos are four runways where 40 railroad cars can be loaded at a time.

principal AA QUALITY products

All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Complete Fertilizers **Superphosphate**
Gelatin **Bone Products** **Salt Cake** **Ammonium Carbonate**
Sulphuric Acid **Fluosilicates** **Insecticides and Fungicides**
Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus

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GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

30 FACTORIES AND SALES OFFICES, SERVING U.S., CANADA AND CUBA—ASSURE DEPENDABLE SERVICE

VIEWING WASHINGTON

with Farm Chemicals Washington Bureau

on agriculture

Return to fixed 90 per cent of parity price supports for corn, cotton, wheat, rice and peanuts could raise farm income by at least $1 billion this year—according to advocates. This, they say, is their reason for pushing for repeal of flexible price supports in the face of stiff White House opposition. While Agriculture Department economists are unanimous in agreeing that a sizeable income boost would result—there's little agreement in official circles over how much of an increase.

To give you an idea of what a return to 90 per cent supports MIGHT mean in terms of farm income, here's an analysis by supporters of high, fixed support legislation:

About 1.6 billion pounds of peanuts would be supported at 12 cents per pound instead of 10 cents. This would mean an increased income of $32 million.

About 900 million bushels of corn sold from the farm where produced would be supported at $1.64 per bushel instead of $1.40. This would raise income by $216 million.

About 7.3 billion pounds of cotton would be supported at 28 cents a pound instead of 26 cents . . . a net increase in farm income of $146 million.

About 800 million bushels of milling wheat would be supported at $2.25 per bushel instead of $1.79, thus adding $368 million to national farm income.

A farm income boost this year already is assured—through higher price props announced by the Agriculture Department for soybeans and flaxseed. Five per cent increases in these two predominantly Midwestern crops are expected to put roughly $40 million extra into farm pockets of that area. In addition to a return to 90 per cent supports in the farm bills, dairy support increases called for would boost income another $118 million. Legislation to refund the 2c-a-gallon federal gasoline tax on fuel used for farm purposes would add still another $60 million to shore up farm income.

Significance of all of this—some of the added money assured and some still only possible—is that farm spending for farm chemicals and other production aids likely will be increased. Soil Bank plans, plus continuing price-cost squeeze puts pressure on bigger yields.

Watch Secretary Benson's proposal to eliminate corn acre allotments. It could spur farm production—if adopted—although the aim is to cut production.

Under the proposal, corn allotments would be dropped immediately and all corn producers would be eligible for supports—presently set at $1.40 a bushel national average. Farmers would be permitted to cut back production from the 1953–55 average—not from the announced 1956 allotment of 43.3 million acres.

This means that many farmers could in effect increase production over 1955—yet be eligible for price supports and payments under a Soil Bank plan. The 1953–55 acreage was about 56 million, and only about half of the farmers cut back to fit the allotment. Conceivably these farmers would increase acreage over previous allotments and still get benefits from federal programs.

Marketing quotas for four types of tobaccos have been increased back to 1955 levels by congressional action. Due to Agriculture Department overestimation of crops, it is possible to wipe out announced sharp 1956 acreage and marketing cuts. The crops involved are burley, fire-cured, and dark air-cured.

VIEWING WASHINGTON

on business

Manufacturers' chemical sales are headed for another record in 1956. A government survey-report confidently predicts sales will top last year's record $23.5 billion by 4-5 per cent. This is the outlook according to the Commerce Department's Chemical and Rubber Industry Report put out by the Business and Defense Services Administration.

In a nutshell, here's BDSA's view of your 1956 prospects:

Chemical production will top the 1955 high by about 3 to 4 per cent.

Capital outlays by chemical manufacturers for new plant and equipment are likely to amount to $550 million in first half of 1956 . . . and about $1,125 million for the year.

Moderate degree of inventory buildup is expected in the first half of the year . . . to support adequately continued high sales volume.

Chemical research and development expenditures will top all records in 1956 . . . probably around $425.

A new record fertilizer activity is expected during the first half of 1956 . . . exceeding comparable period last year. About 450,000 tons of anhydrous ammonia will be added to capacity by year's end.

You can size up the strength of the chemicals industry from outlook for these important specific chemicals: Output of elemental sulfur and virgin sulfuric acid will reach about 6.5 million long tons and 15.3 million short tons. Production of chlorine and the alkalies, at or above record 1955 levels. Production and use of phosphorus and phosphatic chemicals are expected to expand. Benzene production is likely to top the 1955 level.

Competition in 1956 "will place much greater emphasis than in 1955 on increasing efficiency through technological advances and diversification of products and distributive channels," says BDSA.

Higher labor and raw material costs . . . along with advancing capital equipment and research charges . . . are expected to exert upward pressures on chemical wholesale prices this year.

For detailed report, send 15 cents per copy to Sales and Distribution Branch, Office of Administrative Operations, Commerce Dept., Washington 25, D. C.

Good chemical industry outlook for 1956 is in line with revised official forecast for the national economy. Earlier, as we reported last month, prevailing belief indicated a let-down from boominess in second half of 1956. A Farm Chemicals survey now indicates a decided change in responsible opinion.

Predominant business and government thinking now is for a slower economic rise during the first six months of the year . . . generating a stronger increase in the second half. Gross National Product, which stood at about $397 billion at the close of 1955, now is officially expected to reach close to $1410 billions by the end of 1956.

How will Ike's second term decision affect business? Consensus of Washington business opinion is that it will cause a ripple either way he decides, neither a big dip nor a big bulge.

If "yes" . . . then more confidence in business spending, building and the stock market, plus slower rate in inventory buildup.

If "no" . . . then less confidence for a short period. Probable slowdown in business spending, short-run letup in building, even less inventory buildup in inventory.

Your best assurance for a *continuous* supply is a completely integrated supplier!

Kraft Bag Corporation comes closest to being the most completely integrated manufacturer of multiwall shipping sacks in the industry!

Check this chart and see for yourself why Kraft Bag Corporation should be your supplier!

Tell us when we may call to discuss your requirements.

FEATURES	KRAFT BAG CORPORATION	OTHER SOURCES ?
Forest Lands	✓	
Pulp Mill	✓	
Bleach Plant	✓	
Paper Mill	✓	
Multiple Bag Plants	✓	
Natural Kraft	✓	
Colored Kraft	✓	
Bleached Kraft	✓	
Creped Kraft	✓	
Wax Laminated Kraft	✓	
Asphalt Laminated Kraft	✓	
Wet-Strength Kraft	✓	
Water Repellent Kraft	✓	
Stak-LOK Super Rough Kraft	✓	
Valve Bags—sewn or pasted	✓	
Open Mouth Bags—sewn or pasted	✓	
Flat Sewn Valve Bags	✓	
Flat Sewn Open Mouth Bags	✓	
KRAFT-lok Valve Closure	✓	
Creped Tape	✓	
Gummed Tape	✓	
Filter Cord	✓	
Sewing Thread—(the only material we do not produce ourselves)		
1-2-3-4 Color Printing	✓	
Art Department	✓	
Bag Development and Research	✓	

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• The Gilbreath Corp.
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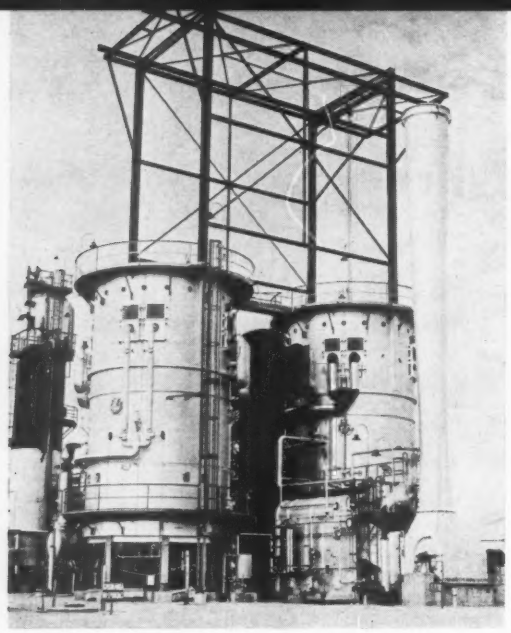
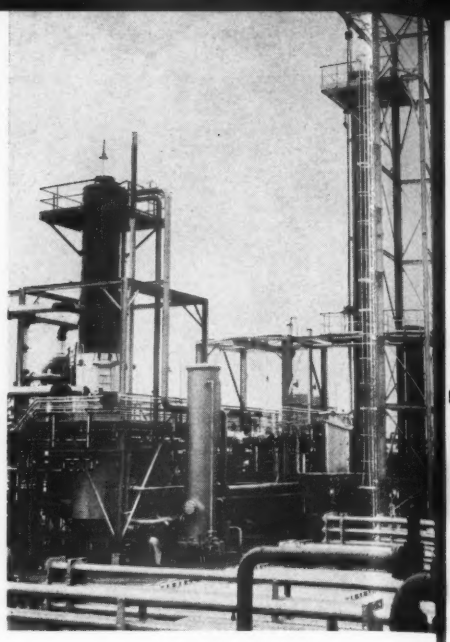
Gilman Paper Company Subsidiary

630 Fifth Avenue, New York 20, N. Y. • Daily News Bldg., Chicago 6, Ill.

Plants at St. Marys, Georgia and Gilman, Vermont



Gas Reforming



Porification

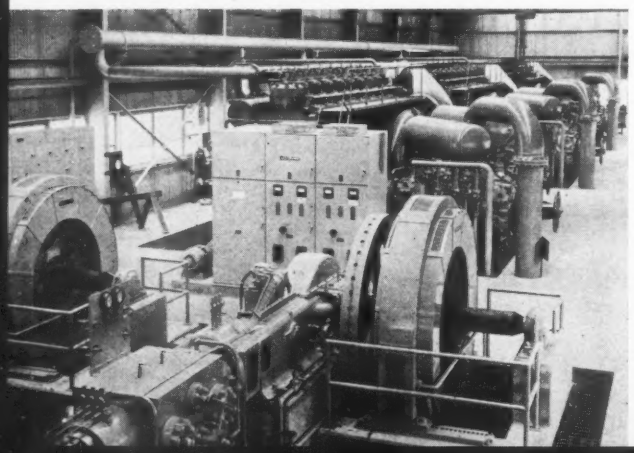
Nitrogen Plant Dedicated by Es

AN IMPRESSIVE array of industry leaders, utility officials, agricultural representatives and others gathered in Pensacola, Fla. on February 17 to attend dedication ceremonies for the new multi-million dollar nitrogen plant of Escambia Bay Chemical Corporation. Senator Geo. A. Smathers and Congressman Robt. F. Sikes were key speakers at the affair.

The first chemical plant of its kind to locate in Florida, it was completed in the record time of eight months by Chemical Construction Corporation, engineers and constructors.

It includes facilities for daily production of 200 tons anhydrous ammonia, 220 tons 100 per cent nitric acid (as 56 per cent water solution), 275 tons 100 per cent ammonium nitrate (as 83 per cent water solution) and 350 tons of pebbled ammonium nitrate.

Compression



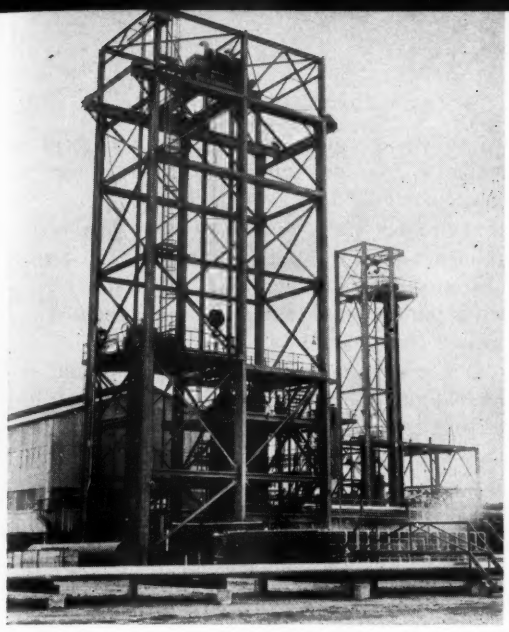
Production of anhydrous ammonia began on December 28 and ammonium nitrate solutions are now being shipped by rail and truck.

Ashcraft-Wilkinson, Atlanta, Ga. has a long-term agreement to act as sole sales agent for the NH_3, Baysol solutions and Ammo-Nite ammonium nitrate, marketing the products only to fertilizer manufacturers and dealers. The 10 A-W offices serve East and Gulf coast states from Virginia to Mississippi and some parts of Tennessee.

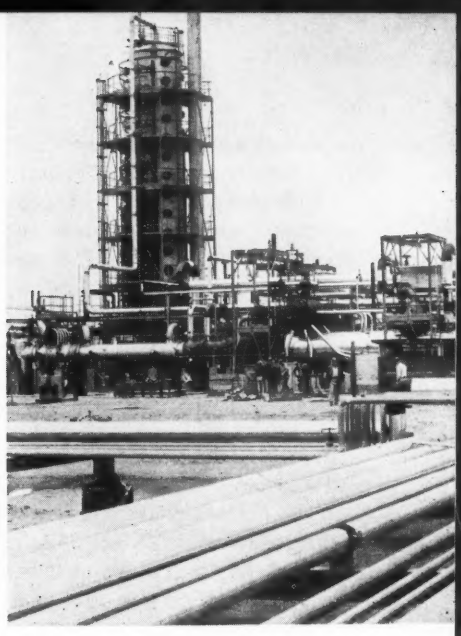
Escambia-Bay was formed in late 1954 by United Gas Corporation (45 per cent interest), Electric Bond and Share Company (45 per cent) and National Research Corporation (10 per cent).

The Escambia Baysite covers some 2100 acres in Santa Rosa county, 20 miles north of Pensacola, 100 acres of which is utilized by the present operation.

Employing CCC's Nitrogen Engineering Corp. process, based on the Haber-Bosch method, the plant is the first of its kind in the US to use a potassium carbonated absorption system for CO_2 removal. Its ammonia converter is the largest ever built, designed for net production of at least 200 short tons per day.

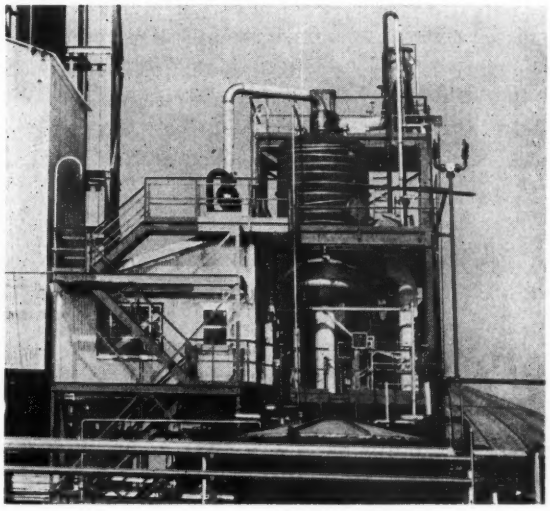


Ammonia Conversion



Nitric Acid

Ammonium Nitrate



Bay-Sol Solution

Converter → Prilling

Ammo-Nite Concentrate

by Escambia Bay

In the gas reforming plant, natural gas is sent through organic sulfur removal equipment, mixed with steam and passed through primary reformer tubes where hydrogen and CO are formed. Some of the CO and steam react to produce carbon dioxide and added hydrogen.

The partially reformed gases go to a secondary reformer where a small amount of residual methane is reformed and sufficient air introduced to provide nitrogen for ammonia synthesis. Hot gases from the reformers are cooled to the 800°F level needed for the shift reaction (CO conversion).

In the CO converter, the steam-gas mixture passes through a catalyst to produce additional hydrogen. Converted gas is cooled and, after one stage of compression, sent to a CO_2 removal system. Here CO_2 is removed by scrubbing with an aqueous solution of potassium carbonate. Heat regenerates the carbonate solution.

Gases are further compressed and, at an interstage pressure level of 2,000 psi, scrubbed with a chilled ammoniacal cuprous acetate solution to remove residual CO and CO_2.

Liquid NH_3 is produced by the NEC process. The mixture is combined with cycle gases at the discharge of the circulating compressors, where most of the ammonia has been condensed from the circulating gas.

The total gas flow is pre-cooled, then sent to secondary condensers for a final condensation of ammonia. This step is a feature of the NEC process in that the condensing ammonia stream tends to remove any impurities which might poison the synthesis catalyst.

Leaving the converter, gases are cooled in primary

condensers where most of the ammonia is condensed and removed at primary separators as liquid NH_3. Uncondensed gases are recirculated.

After measurement, ammonia is sent to storage in three 2,000 ton capacity Hortonspheres, tank cars and trucks, the nitric acid plant, or to the ammonium nitrate departments.

In nitric acid production, liquid NH_3 is vaporized and mixed with hot compressed filtered air. In an ammonia burner ammonia reacts with oxygen in the air to produce nitrous oxide and water.

Burner products—nitrous oxide, nitrogen, oxygen and water vapor—are partially cooled and introduced into the bottom of the tower where compressed air is charged to oxidize NO to NO_2. The NO_2 is rapidly absorbed by the water, reacting to form nitric acid and nitrous oxide, the oxide combining with oxygen and water to produce more acid.

Acid flowing from the bottom absorption tray is bleached with secondary air and the 56 per cent material flows to storage tanks at the nitrate tank.

Liquid ammonia from storage is vaporized and mixed with acid in a neutralizer to produce an ammonium nitrate solution of about 83 per cent concentration. This solution is continually withdrawn to storage and from there can be sent to ammoniated solutions production storage or the prilling tower.

Ammoniating solutions are made by mixing the ammonium nitrate solution and ammonia plus small quantities of corrosion inhibitors. From the mixing tank it is pumped into tank cars for shipment under the Baysol trade name.

From the ammonium nitrate solution tank, the 83 per cent mixture can also be sent to a concentrator where a 95 per cent solution, essential for pebbling, is achieved by boiling at about 280°F under a partial vacuum.

This solution is pumped to the top of the prilling tower after passing through a steam heater and flows to a system of spray headers. Falling drops of solution meet a large volume of air being pulled upward by a series of fans. The relatively cool air chills the drops to form "pebbles" which are collected on a conveyor belt at the bottom of the tower and transported to the drying system.

A diatomaceous earth coating is added to the dried pebbles in a tumbler mixer and the finished material is screened, bagged, weighed and conveyed to storage or for shipment under the trade name Ammo-Nite. ▲

Who's Who at Escambia Bay Chemical

DAVID J. STACK, vice-president and plant manager. Native of Calgary, Alta. Former plant manager, assistant plant manager, National Petrochemical Corp., Tuscola, Ill.; technologist, chief technologist and department manager, Shell Oil Co. of Canada. Chemical engineering degree from University of Oklahoma.

RALPH M. BROWN, general superintendent. Born in Gadsden, Ala. Served as polyethylene plant superintendent, National Petrochemicals; technologist, operating assistant, Shell Oil Co., Wood River, Ill. Chemical engineering degree from Alabama Polytechnic Institute.

WM. R. MOORE, purchasing agent. Native of Montreal, Que. Was director of systems and audits, National Petrochemicals. Previously was with Shell Chemical Co. of Canada, later opened his own accounting offices in Vancouver. Accounting degree from Sir George Williams College.

ANTHONY J. BRUNO, Jr., chief engineer. Born in New Orleans, La. Former assistant to director, Olin-Mathieson Chemical Corp., Niagara Falls. Also held positions with Barrett Div.; Bowman Gum Co.; Pittsburgh Coke & Chemical Co. Chemical engineering degree from Louisiana State University.

JOHN H. HECKERT, ammonia plant superintendent. From Weston, W. Va. Was chemist with Commercial Solvents Corp. at Sterlington, La. Degree in chemistry from St. Vincent College.

DURWOOD L. BROOKS, traffic manager. Native of Altoona, Pa. From Chemstrand; was formerly rate clerk for Louisville & Nashville RR at Pensacola. BS degree from University of Alabama.

EVERETT STOKES, office manager. From Alto, La. Had been district chief clerk, United Pipeline Co. BS degree from Louisiana State University.

E. M. SPURLOCK, director, plant personnel. From Fort Worth, Tex. Was associated with United Gas Pipe Line Co. Attended Centenary College.

Larrick Featured at NAC Spring Meeting

GEORGE P. LARRICK, US Commissioner of Food and Drugs, will head the program at the spring meeting of the National Agricultural Chemicals Association to be held on March 14–16 in the Hollywood Beach Hotel, Hollywood, Fla. Larrick is scheduled to discuss the effects of F&D legislation on farmers and growers.

Other major subjects to be covered during the three day convention include the NAC program for promoting safe use of pesticides, the use of atomic energy in agriculture and the future of fungicides in controlling plant diseases.

A special event will be the presentation of a proclamation by LeRoy Collins, governor of Florida, of March 19–25 as "Food and Drug Anniversary Week" in that state, commemorating the 50th anniversary of food and drug legislation.

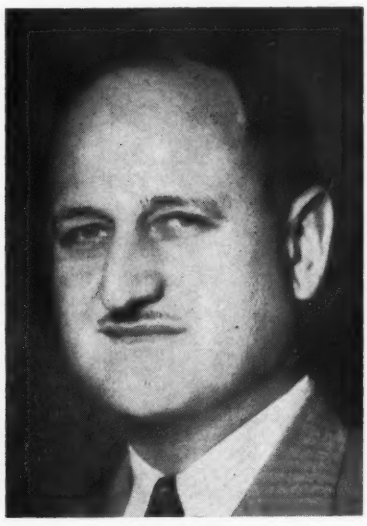
W. W. Allen, NAC president and manager of agricultural chemical sales for the Dow Chemical Company, will open the meeting on the 14th, with a report on the industry. Other speakers and their topics, on the Wednesday program include: Dr. J. Wayne Reitz, president, University of Florida, "Universities and the Chemical Industry;" John S. Field, vice-president, Carbide & Carbon Chemicals Co., "The Agricultural Chemicals Industry—A Teenager Growing Up;" and Dr. S. B. Hendricks, USDA Agricultural Research Service, "Atomic Energy in Agriculture."

On the 16th, the program includes Larrick and presentation of the Florida F&D proclamation. Lea S. Hitchner, NAC executive secretary, will present a report on the association's "Read the Label" safety program and other speakers include Dr. Geo. L. McNew, Boyce Thompson Institute, "The Future of Fungicides in Agriculture;" Dr. H. L. Haller, assistant director, Crops Research, USDA, "USDA Programs Affecting Pesticides;" and Dr. H. G. Johnston, National Cotton Council, "Research and Economics in the Cotton Industry."

Association committees will meet on Thursday, March 15 the date on which NAC executives Allen and Hitchner are scheduled to hold a press conference to answer questions concerning the industry.

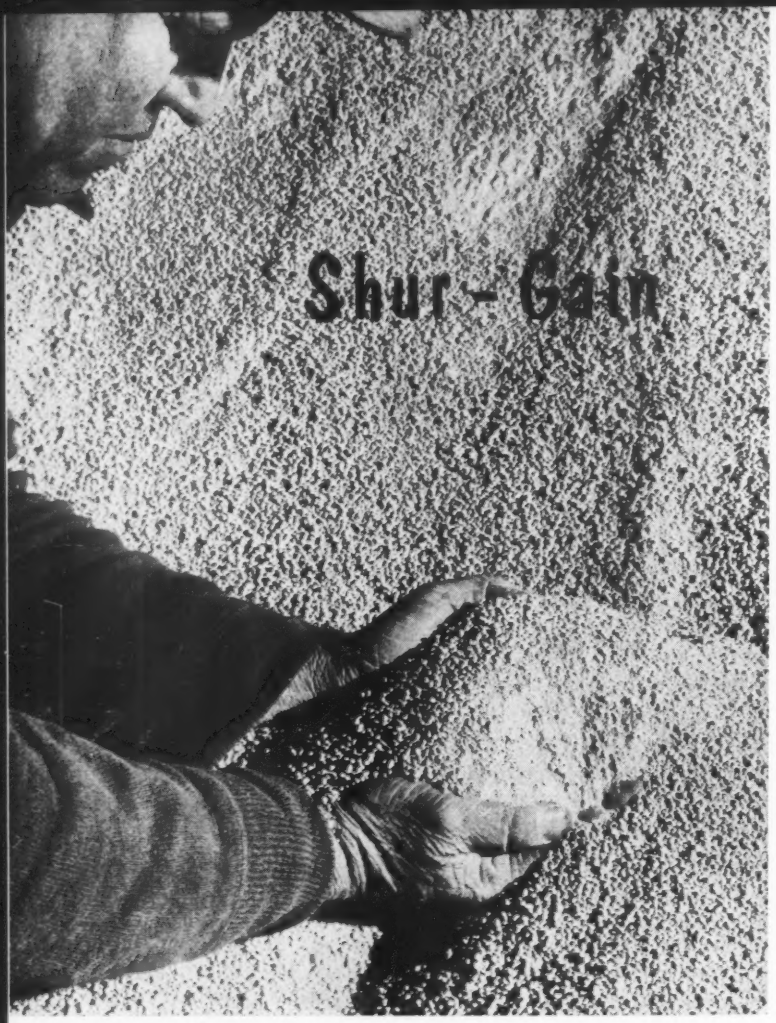
H. G. Johnson

G. P. Larrick



G. L. McNew

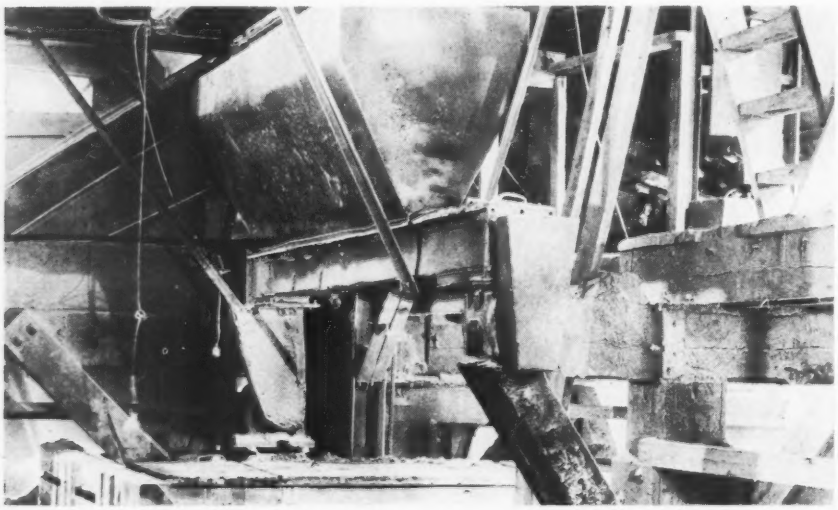
Granulated Pl



70% of production during 1956 will be shipped in this form from Canada Packers St. John plant.

EVIDENCE of the rapid acceptance of granulated fertilizers by northern farmers is revealed by the experience of Canada Packers, Ltd., at its St. John, New Brunswick, plant. With granulation facilities installed less than a year and a half ago, the plant is expected to ship 70 per cent of its 1956 output in this form, and Canada Packers anticipates 100 per cent granulated sales within a short time.

Designed and installed by the Sturtevant Mill Co. of Boston, the St. John facilities now incorporate a complete Sturtevant package unit, adapting the plant to granular plant food production in addition to conventional pulverized material.



Mixer and accessary equipment, seen from below.

ted Plant Foods

Canada Packers finds ready acceptance of granular plant foods produced at St. John with Sturtevant unit

Moisture can be added in a TVA ammoniator or pug mill (shown) at a rate of two- to four-and-one-half gal. per minute.

Solid fertilizer materials are first blended with liquid ammonia in a mixer; then water is added at two to 4½ gallons per minute, depending on the ingredients. This can be accomplished, in the Sturtevant design, by using a TVA ammoniator or a pug mill.

From here, material is fed into the granulator section of the dryer at the rate of 13 to 17½ tons per hour. This slightly inclined combination unit, 40 feet long with an outside diameter of 7 feet, is rotated at 11.3 rpm by a 30-hp gear motor drive.

Materials enter the granulator section at the cool end of the dryer and are tumbled by the specially designed interior flights. From the other end, a 15,000 cfm air furnace capable of developing 9,000,000 btu/hr supplies the necessary hot air.

Within the unit an average temperature of about 200° F is maintained and the combination of heat and tumbling, under controlled conditions, develops the small, homogenized granules.

Cooling to Screening

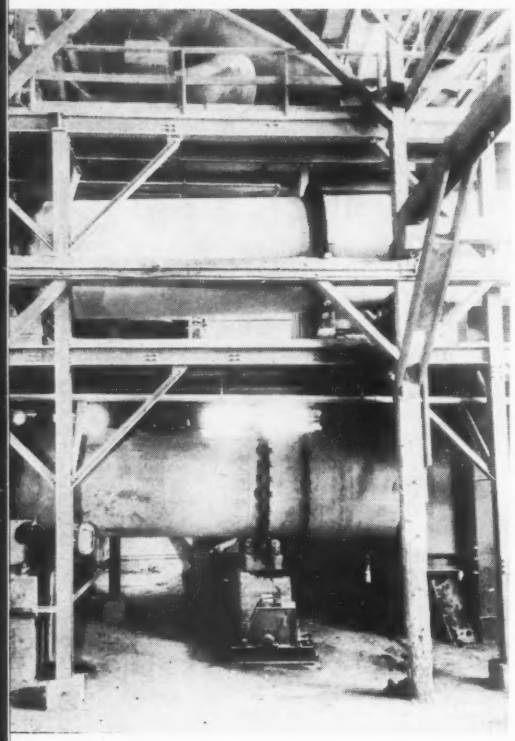
From the dryer, granules are conveyed into a 40-foot cooler, six feet in diameter, while at a temperature of about 200° F (2 per cent moisture). Specially designed flights and controlled cooling air develop a dry, well-formed, hard-pelleted material.

The complete cycle through dryer and cooler takes about 20 minutes, thus the two units hold about four tons of material at any given time.

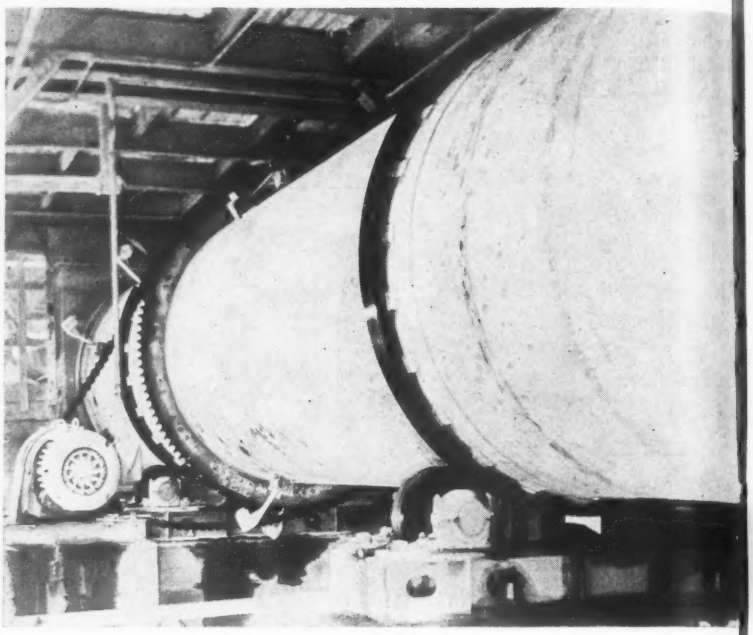
Controlled air velocities remove the dust at both dryer and cooler, sending it to a cyclone where the dust is separated and carried back into the conveyor system and recirculated through processing operations. Air from the cyclone passes through a rotoclone for final cleaning.

From the cooler, the product is classified on a double-deck screen. Since this operation is new, little data are available, but it is estimated that 60 to 70 per cent passes through the 5-mesh screen.

Oversize is recycled to the screen after passing through a rotary pulverizer. The lower 30-mesh



Overall view of major section of the plant shows degree of incline of dryer (bottom) and cooler (above). Portions of rotoclone are shown at top of photo.



Close-up of the exterior of the dryer, which is 40 feet long, 7 feet in diameter and similar in appearance to the cooler.

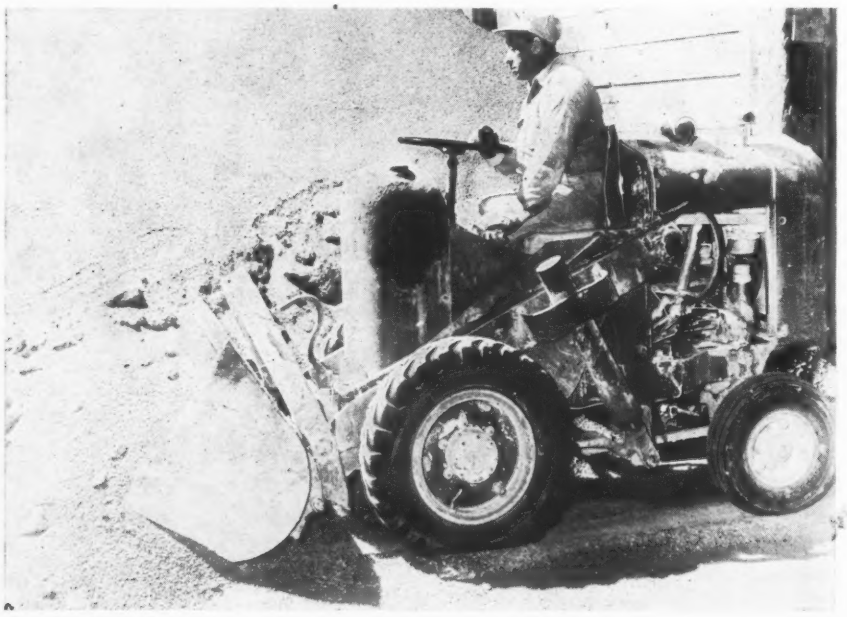
screen holds on size particles and passes fines which are returned to the processing cycle.

The End Product

After classification, the finished product goes directly to storage bays where it ages for a period of from a day to about a week. It is then bagged and shipped under the Shur-Gain Fertilizer trade name.

Six men are required in the granulation operation to handle all operations—material assembly, mixing, granulation and distribution to storage. This is one man less than was required for production of conventional pulverized fertilizer.

This pioneering effort of Canada Packers at St. Johns, supplying New Brunswick and northern Maine, appears an unqualified success with a very satisfactory installation. Only one problem is anticipated—keeping up with demand. ▲



The product is aged for one day to a week in storage bins. A tractor shovel takes the material to the bagging station.

The Substituted Ureas and Industrial Weed & Brush Control

By John E. Naylor

E. I. duPont de Nemours & Co.

CHEMICAL herbicides have become increasingly important as necessary and economical tools for industry to use in areas where undesirable vegetation creates a maintenance problem. While it is true that much work involved in keeping industrial sites clear of vegetation can be done by manual or mechanical means, it is apparent to those well acquainted with weed and brush control that chemical herbicides will continue to be recognized as the most economical and efficient method in most instances.

During the past several years, the use of the substituted ureas, particularly Telvar W weed killer, an 80 per cent formulation of 3-(p-chlorophenyl)-1,1-dimethylurea, and Telvar DW, an 80 per cent formulation of 3-(3,4-dichlorophenyl)-1,1-dimethylurea, has resulted in the establishment of these two compounds as important chemical "tools" for use in the control of undesirable vegetation on industrial properties, particularly where "bare ground" is desired. Another chemical compound, phenyldimethylurea, is showing promise for brush control.

The substituted ureas are formulated as wettable powders and are designed for application with water or other liquids as carrier. They can also be used in combination with other herbicidal agents, both in liquid and dry formulations.

Telvar W & DW Differences

We are often asked the difference between the two principal compounds, namely, Telvar W and Telvar DW weed killers, so far as their use in the field is concerned. Basically both compounds are equally effective biologically and, once they are absorbed into plant roots in sufficient quantities, either gives the same result.

The main difference is their relative solubilities. Telvar DW is only about one-sixth as soluble in water as Telvar W. It is this difference in solubility that usually establishes a preference for one product over the other.

The general statement can be made for both Telvar W and Telvar DW that the best time for application and the optimum dosages required for different weed and brush situations vary with the type of vegetation, climatic factors and differences in soil and rainfall.

Specifically, however, we can go one step farther and suggest which of the two to use in a particular situation. Where rainfall is 20 inches or more and/or the soil is of a light, sandy structure, Telvar DW will do a better job of vegetative control. Where the opposite prevails, it is likely that Telvar W weed killer will do the best job. All of this is based upon the assumption that the material is applied properly, preferably before rains and prior to growth of vegetation to a dense stand.

New Application Concepts

Some new concepts in the use of the substituted ureas have resulted from their use in the field over the past few years.

We have found that Telvar DW when applied in the fall or late winter, does a good job on vegetation growth appearing the following spring. Due to its low solubility of approximately 40 ppm, it remains at the soil surface during the dormant period and effectively controls early weed emergence. The advantage in this type of application would be for those who find the fall and winter period the most convenient time for work of this type, and, therefore, a good opportunity to prepare for spring weed control.

The use of the substituted ureas on a maintenance basis is becoming a practical procedure. It has been found that a heavy initial application followed in successive years by much lighter repeat applications

maintains "bare ground" control at nominal cost. Over a period of years, this can result in savings of 25 to 75 per cent as compared with control by some other methods.

The use of the substituted ureas in combination with other herbicides to obtain additional benefits in a specific situation is increasing. For example, the use of weed oils as the carrier for the substituted ureas permits application to be made to existing vegetation later in the growing season, after the weeds have emerged. The oil results in a contact kill of existing vegetation and the substituted urea supplements this contact action as well as providing residual control of seedling plants.

Herbicides such as the borates-chlorates, 2,4-D and/or 2,4,5-T, dalapon and others are also being used in combination with the substituted ureas, particularly where a specific vegetation problem can be more effectively and economically solved than by using the substituted ureas alone. This is sometimes the case where deep rooted perennials and vines are the major problem.

Granules and other types of dry formulations containing the substituted ureas in combination with other herbicides are being evaluated for use where it is desirable to use a dry product at heavy rates per acre for complete vegetation control on industrial land, particularly where it is inconvenient to make spray applications.

Industrial Brush Control

Industrial brush control with the substituted ureas appears promising. Two products appear particularly suited for this use, Telvar W and phenyldimethylurea. Telvar W is already recommended in six south central states for chemical control of trees and brush by soil application. The most promising applications are on utility right-of-ways, railroads, and drainage ditches. The spray is applied to the ground encircling the base of the plant at a reasonable distance to include the major root system of the plant. It is not necessary to wet the stem of the plant. Two to four ounces of Telvar W are used in each gallon of spray, and one gallon of spray should treat approximately 18 to 20 plants.

Treatment is effective at any time of the year when rainfall is likely to occur. In any event, however, it should be kept in mind that results are relatively slow to appear and the plant may leaf out several times before it finally dies.

Present recommendations for using Telvar W for brush control apply only to Texas, Oklahoma, Kansas, Missouri, Arkansas and Louisiana. Test work is continuing to determine if this recommendation can be adapted to climatic conditions, plant species and soil types in other areas. Woody plant species which have been controlled by this method include: Elm, persimmon, hackberry, willow, sumac, buck brush and various species of oak.

Granulated Formulations

Investigators in many of these states are experimenting with the use of pelleted and granular formulations of the substituted ureas for brush control. Indications are that the dosage rate can be materially reduced on an acre basis by broadcasting the pellets sparsely over the ground or, as an alternative, applying them in strips across the area. The result is that high concentrations of the herbicide are located at one spot and extensive lateral roots of the brush come in contact with sufficient quantities to result in a lethal dose to the plant.

This method, while still new, gives the added advantage of minimizing kill of low growing species of grasses and other desirable plants in situations where it is desirable to retain a cover. Actually, grass cover is often much more luxuriant after tree competition is removed. Also, this method suggests the important possibility of airplane application over rangeland areas to control mesquite and oak without injury to desirable forage grasses.

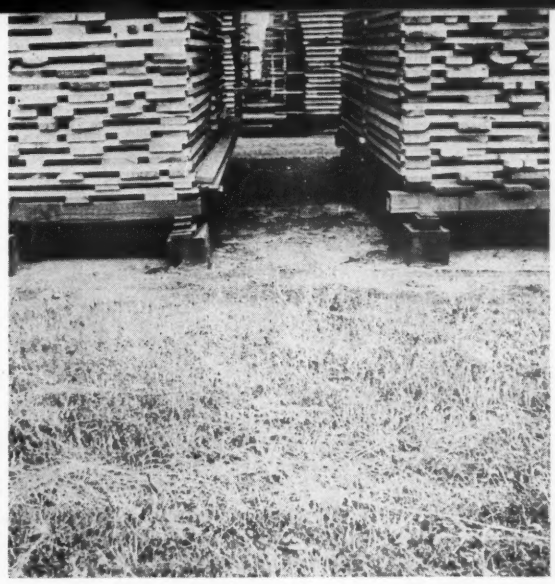
Phenyldimethylurea, which is soluble in water to 2300 ppm, appears promising on brush because of this solubility. While it is not as active biologically as either Telvar W or DW and therefore does not fit into the general industrial picture for soil sterilant type work, it does appear to work well for brush control. Considerable evaluation still must be done with the substituted ureas on brush before the final picture can be completed, but certainly the work to date shows markedly promising results.

It is important that anyone doing work on brush with the substituted ureas realize that these products are capable of killing nearby brush off the right-of-ways where their roots extend into the treated area. In working with these compounds, surrounding vegetation should be carefully considered so that no damage is done to desirable trees or shrubs.

As with any complex field, the accumulation of useful information on weed and brush control comes from many different sources and extends over a period of many years. With continued work, we hope the substituted ureas will go far as one of the groups of chemical herbicides to solve some of the problems of weed control in industrial areas. ▲

From a talk, "Industrial Weed and Brush Control with the Substituted Urea Herbicides," presented at the Weed Society of America charter meeting, January 5, 1956.

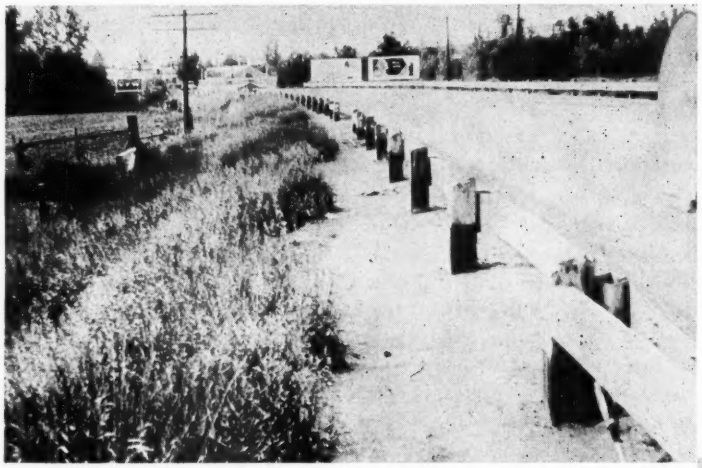
Some Industrial Weed Control Opportunities



LUMBER YARDS

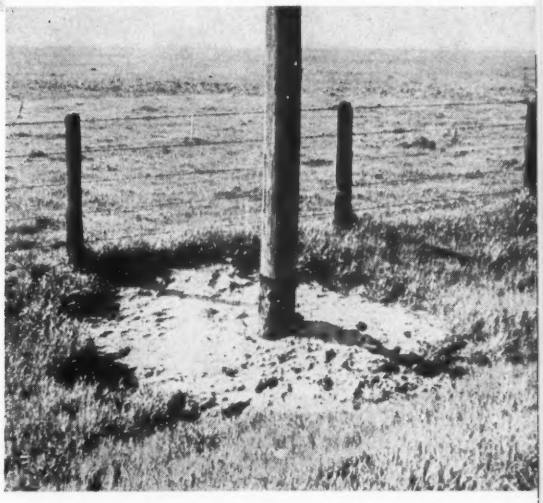
STORAGE AREAS

HIGHWAY SIGNS



ROADSIDES

POLE SCALPING



FENCE LINES

New Officers of the Mississippi Entomological Assn.: (seated) David Young, Jr., Agr. Ext. Serv., pres.; Ed Broadus, Niagara Chem. Div., vice pres.; Roy Bailey, General Chem. Co., sec.-treas. Standing are directors R. P. Colmer, State Plant Board; Reid Faulkner, Chapman Chem. Co.; L. C. Murphree, Coahoma Chem.

Systemics, Miller bill, application discussed at

Miss. Insect Control Meet

MORE than 250 farmers, agricultural workers, entomologists, insecticide dealers, formulators and aerial applicators heard the nation's top authorities on insect control at the second annual Mississippi Insect Control Conference held at Mississippi State College during early January.

Included among the speakers were such well known entomology research men as K. P. Ewing of the Cotton Insect Section Research Branch, USDA, Washington, D. C.; Dr. George Decker, past president, Entomological Society of America, of Urbana, Ill.; and W. C. McDuffie of the Entomology Research Branch, USDA, Beltsville, Md.

In a report of research results of systemic insecticide use in cotton insect control, Ewing stated that results amply justify limited farm trials during 1956 for control of thrips, aphids and spider mites. He emphasized that such trials should be conducted on a limited grower basis, under the close supervision of entomologists, until general recommendations for use of the insecticide can be made.

McDuffie, in discussing research findings on systemic insecticides for control of animal insects, indicated that only limited results have been obtained so far, and that research is still in experimental stages.

Speaking on the Miller Bill, an amendment to the Food, Drug and Cosmetic Act of 1938, Dr. Decker emphasized that most insecticides have only a few approved uses.

"Just because an insecticide can be bought at the market place does not mean that it can be used promiscuously and without danger on all crops," he stated. "It is imperative that growers determine in advance that the particular insecticide has label acceptance for a specific pest and crop."

"When a grower ignores the label and takes matters into his own hands, he assumes a risk for which he and he alone is responsible," Dr. Decker declared.

He added that generally insecticide users who carefully read and closely follow instructions and warnings on insecticide labels will find little difficulty in meeting the established tolerances.

McDuffie cited the build-up of resistance by insects to some insecticides. He indicated that organic phosphorus compounds are offering promise for control of the resistant insects.

Also featured on the program were panel discussions on application of insecticides, use of systemics and cotton insect control failures, resumes of research work now being carried out in Mississippi, progress reports of academic entomology, control of white fringed beetle, sweet-potato weevil, prevention of entrance to Mississippi of pink bollworms and qualities of insecticides.

A "Distinguished Service Award" was presented to Dr. E. W. Stafford of Mississippi State College for 39 years of outstanding service to entomology on behalf of the Mississippi Entomological Association by Dr. Clay Lyle, dean and director, Div. of Agriculture at Mississippi State College.

Officers for 1956 chosen at the annual business meeting of MEA are David Young, Jr., assistant Extension entomologist, president; Ed Broadus of Jackson, vice president; Roy Bailey of Greenville, secretary-treasurer. New Directors are R. P. Colmer of the State Plant Board; Reid Raulkner of Greenville; and L. C. Murphree of Starkville. ▲

by Dr. Melvin Nord

PATENT REVIEWS

New Process for Phosphate Fertilizer

US 2,722,472 issued Nov. 1, 1955 to Ira M. LeBaron and assigned to International Min. & Chem. Corp. describes a process for preparing fertilizer, primarily monocalcium phosphate, and animal food grade phosphate, predominantly fluorine-free dicalcium phosphate.

It consists of preparing extract liquors by leaching separately aged and green superphosphates; mixing with the aged super extract sufficient calcium-bearing reactant for reduction of fluorine content below .06 per cent, without precipitating more than minor amounts of dicalcium phosphate; segregating solid phase material from the defluorination reaction; mixing it with green extract and recovering phosphatic constitents as a dry, predominantly monocalcium phosphate material.

As shown in the flowsheet, phosphate rock is conveyed from storage area 10 to mixing station 12 and mixed with sulfuric acid. Particles of +200 mesh size from leaching and classification operations subsequently described are also delivered to 12.

Acid mix from 12 is delivered by conveyor 14 to storage area 15 or directly to secondary mixing station 16. In 16 aged or unaged acid mix is combined with liquid supplied through conduit 17 from a source later described.

Slurry from 16 is delivered to primary classification station 19 where +14 mesh size material is removed. Slurry underflowing 19 goes to a countercurrent leach-filtration system (filtration stations 20, 21, 22; mixers 23, 24).

Oversize from 19 is conveyed to classifier 25. Material passed as oversize from here goes to conveyor 26 delivering cake from filter 22 to filter cake reclassification operation 27. Underflow slurry from 25 is delivered to filter 22.

In the countercurrent extraction system, water added to mixer 24 is utilized to slurry filter cake from filter 21. Solids are removed from the slurry from 24 to filter 22. Filtrate from 22 is utilized to slurry filter cake from filter 20 in mixer 23. Slurry from 23 is filtered in 21, and solid cake from 21 is delivered by conduit 17 to mixer 16. Filtrate from 20 is an enriched extract containing the soluble phosphatic constituents of the acid mix.

Cake from 22 with oversize from 25 is mixed with water and delivered to secondary reclassification operation 27, via conveyor 26 to hydroseparator 28. Overflow from 28, primarily gypsum and phosphate solids of −200 mesh, is sent to waste storage.

Underflow from 28, +200 mesh size solids in slurry form, is separated by screening system 29 which divides it into +24 and −24 mesh fractions. The +24 mesh portion, high in unreacted phosphate rock, is delivered to Atkins classifier 30 which divides it into two portions. The larger size is returned by conduit 31 to mixing tank 13, the smaller goes to hydroseparator 28 through conduit 32.

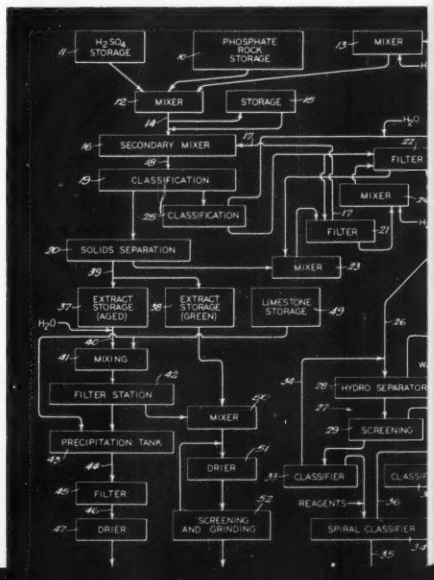
The −24 mesh fraction from 26 goes to Atkins classifier 33 and overflow from 33 returned by conduit 34 to 28. This underflow is mixed with reagents and delivered to spiral classifier 34 which produces a tailing fraction 35 that is sent to waste. Concentrate from 34 goes via conduit 36 to classifier 30 where unreacted phosphate of sufficiently large size is trapped and returned to mix tank 13.

Extract or filtrate from filter 20 goes to storage tanks 37 and 39 through conduit 39. Aged super extract is in 37 and extract from green or unaged in 38.

Extract from 37 is delivered to mix tank 41, the solids content adjusted to 12–18 per cent P_2O_5 with water and comminuted limestone from storage area 49 added. The resultant slurry is passed to filtering station 42 where a cake is produced, predominantly unreacted limestone and precipitated fluoride complex.

Filtrate from 42 is heated to about 175–212° F in precipitation tank 43 and more limestone from 49 added. The reaction product in 43 is dicalcium phosphate of low fluorine content and goes to filter 45 which removes dicalcium phosphate solids. These are sent by conveyor 46 to dryer 46 where a dry product of about 20 per cent phosphorus (46 per cent F_2O_5) is obtained.

Cake from 42 is mixed in 50 with green extract from 38 and moisture is removed from the resultant slurry, predominantly monocalcium phosphate, in dryer 51. Dry solids are screened and ground to a −8 +12 mesh solid with about 56 per cent APA, useful as a fertilizer. Undersize from screening operation 52 is returned to the system by mixing into the wet slurry being delivered to 51. ▲



Chemicals

FDA Tolerance

A tolerance of 25 ppm for residues of calcium cyanide has been approved by FDA on barley, corn, rice, rye and wheat.

NAC association's BHC committee has filed a petition requesting approval of a 2.5 ppm residue tolerance for lindane in or on alfalfa and clover, corn and wheat, the meat of cattle, goats, sheep and swine and the fat of poultry. A tolerance of 0.1 ppm in milk was also requested.

Ohio Firm Makes Insectide Aerosol

A new aerosol insecticide, the Skotch Kooler Insect Killer, is offered by the newly formed chemical division of Hamilton Metal Products Co., Hamilton, Ohio. Packaged in a 12 ounce can, it is said to be the first such formulation to eliminate kerosene.

Offer Two Liquid P Feed Supplements

Two new liquid phosphate feed supplements are now on the market both offering 23.7 per cent phosphorus and available at $85.00 per ton, $3.59 per unit of phosphorus, freight exempted.

Monsanto Chemical's inorganic chemicals division is distributing its phosphate feed solution by tank car or truck from facilities at Long Beach, Calif.; Kearny, N. J.; Trenton, Mich.; and Monsanto, Ill. Deliveries are made by Shea Chemical Corp. from Adams, Mass.; Columbia, Tenn.; Jeffersonville, Ind. and, this fall, from Dallas, Tex.

European and African technicians conduct tests in new labs built by the Pyrethrum Board at Nakuru.

AP&C Elemental Boron Price Reductions

Price reductions of up to 35 per cent for quantity lots of elemental boron have been announced by American Potash & Chemical Corp. The reductions are expected to stimulate development work in industrial applications of elemental boron.

New prices range from $25 per pound, in lots of one to four pounds, to $13 per pound for quantities of 100 pounds or more of Trona Standard 90–92 per cent Elemental Boron.

Kenya Pyrethrum Research Lab Open

Late in 1955 a $100,000 laboratory for pure research in pyrethrum was opened at Nakura, Kenya Colony, by the Pyrethrum Board of Kenya, a producers' association. Research will be conducted on fundamental questions such as the basis of pyrethrum, increasing flower volume while retaining pyrethrin content, breeding to increase content of pyrethrins and the breeding of improved strains.

Specially designed equipment and temperature and humidity control machinery, shipped thousands of miles to the laboratory, are operated by European and African technicians.

Flower samples are ground and their extract distilled and tested with new spectrophotometric equipment. In a separate wing, insects similar to those encountered here and in Europe as well as the Tropics are bred and used in biological activity tests.

Thylate Fungicide For Orchards in '56

Thylate, a thiram fungicide from DuPont, has been accepted for review by the FDA and is being readied for the 1956 season. Based on tetrathiuramdisulfide, the light-colored apple fungicide has demonstrated excellent control of apple scab and has done well against the cedar-apple rust.

During the past two seasons, trial quantities of an orchard spray formulation were made available to a few growers who reported a fine quality finish to the fruit at harvest. Even with Golden Delicious there has been no russeting.

This year the only recommendations proposed will be for use on apples, but tests have been conducted on other fruits and some vegetables. Plans are underway to market the material in five and 50 pound bags.

The usual recommendation on apples is one and a half to two pounds per 100 gallons applied in a conventional scab control schedule but it can also be used in concentrate sprays up to eight times normal concentration.

UofC Tests Endrin On Cyclamen Mite

Endrin has proved encouragingly successful against cyclamen mite in lab and commercial tests according to University of California entomologists, far superior to other available materials.

A spray application of two pints of an 18.5 per cent endrin emulsifiable concentrate plus four ounces of Triton X-100 in 100 gallons of water is suggested, applying a series of three sprays at three-week intervals repeated in four to five months.

Ceresan for Rice Seed Treatment

Ceresan seed disinfectant is now recommended by several state experiment stations for treatment of rice seed. The material has been registered for this use, except on water-seeded rice.

PEST REPORTS

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

Livestock Pests Active

DURING the first two months of this year livestock pests were of concern in many widely-scattered areas. In Oklahoma cattle grub counts averaged 25 per animal in Harper county, 9 per animal in Canadian and Payne counties and 22 per animal in Osage county during January. By the middle of February, however, the infestations in some areas of this state were rapidly declining as inspections at meat packing establishments in Oklahoma City showed an average of about three grubs per animal.

A survey in six counties in Arkansas in mid-January showed an average of 8 grubs per animal and at this time Maryland reported an average of 4 grubs per infested animal in Montgomery county and Kansas had 4 per animal in Johnson county.

Other states experiencing some trouble with these insects during late January and early February included Texas, where infestations were heavier than normal on cattle in Madison county, North Carolina, which had some light infestations; Virginia, where infestations were light to medium at Blacksburg and medium to heavy on the Eastern Shore; and Utah, which had widespread infestations.

Cattle lice were also a problem in some states. The infestations in Kane and Iron counties, Utah, were serious during late January and were becoming serious in many additional counties by early February. In Wasatch county, however, cattle dipped or sprayed during the fall of 1955 were found to be relatively free of lice.

Infestations in Arkansas were generally light but some heavy infestations were noted. Herds in western Cass county, North Dakota, were found to be 33 per cent infested with infestations ranging from light to medium. Virginia reported heavy infestations on beef cattle at Blacksburg around the middle of February.

Spot. Alfalfa Aphid Potential

Although the spotted alfalfa aphid was not causing general widespread damage on alfalfa in the early weeks of 1956, light to damaging infestations were reported from California to Arkansas. Light infestations occurred in Imperial, Alameda and San Joaquin counties, California, in late January and high populations were widespread in Kings county where 4,870 acres were sprayed. Moderate infestations were found in parts of San Diego county.

In Arizona scattered heavily-infested alfalfa fields were reported in the Yuma area and the Salt River Valley in late January but the overall infestations in this state were lighter than at the same time in 1955.

Light to medium populations infested alfalfa in Denton, Grayson, Fannin, Hunt, Navarro, Brazos and Burleson counties, Texas, and the aphid was numerous in alfalfa in Millard county, Utah, up to February 1. Infestations in the Red River bottoms of southwestern Arkansas had reached economic proportions by mid-January.

Truck Crop Pests in South

Insect activity was widespread on vegetable crops in the lower Rio Grande Valley of Texas during the second week of February but was mostly light to medium. Fall chinch bug infestations, however, were very heavy on lettuce, turnips and beets. Aphid populations were medium on lettuce and darkling beetles were locally heavy on tomatoes in the Mission area.

Other insects causing some concern were corn earworm on lettuce, beet armyworm on spinach, cabbageworms on cabbage and broccoli and cabbage aphid. This latter insect was showing considerable increase in populations at this time.

In the Charleston, South Carolina, area, green peach aphid was moderately abundant in cabbage plant beds and on spinach during the latter part of January. Turnip and cabbage aphids also caused some concern on cole crops in this area. Vegetable weevil was damaging turnips in southeastern Georgia in mid-February.

Sweetpotato Weevil Gains

The sweetpotato weevil, an introduced pest of sweetpotatoes, which occurs in areas of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia and South Carolina, has been found in several new counties recently. These include Houston and Geneva in Alabama; Gulf, Franklin and Bay in Florida; Oktibbeha in Missis-

sippi; and Bleckley, Dodge, Harris, Pulaski, Troup and Laurens in Georgia.

Grain Mite

Spotted heavy infestations of winter grain mite occurred in many small grain fields in the north Texas area in mid-February. Heavy local infestations of false chinch bugs were reported on alfalfa in Dimmit county, Texas, in late January.

Alfalfa Weevil

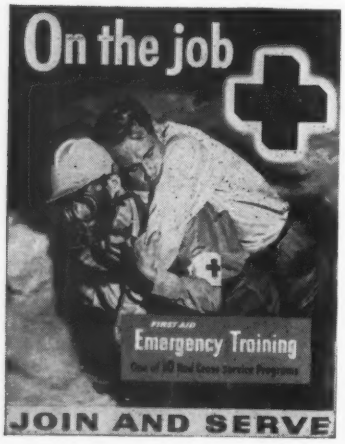
Based on fall egg survey for alfalfa weevil, in New Jersey, this pest may be of serious economic importance in that state in 1956 as far north as Trenton and some commercial damage will occur as far north as Monmouth, Middlesex and Hunterdon counties.

Corn Earworm

A survey of the infestation and damage by corn earworm to dent corn in Illinois shows that this pest caused an estimated average loss of 1.3 per cent of the crop in 1955. The damage by the earworm in Illinois was much less severe in 1955 than in 1953 and 1954.

Mex. Fruit Fly

First Mexican fruit flies of the current season for the lower Rio Grande Valley of Texas were trapped in citrus orchards January 31. The appearance of this serious pest of citrus in the valley is considerably later than in the previous season when the first specimen was taken December 17, 1954.



Boll Weevil

Boll weevil hibernation counts in Chicot, Hempstead, Pope and Franklin counties, Ark., show an average of 866 weevils per acre of ground trash compared with 224 weevils per acre in winter of 1954-55. Inspections of surface debris for pink bollworm were made in 3 counties of Arkansas, I in Oklahoma and 44 in Texas during the last half of January. Oklahoma and Arkansas counties were negative while of 44 Texas counties, 18 were negative. Nineteen per cent of the fields inspected in Texas showed live pink bollworms.

For the four lower Rio Grande Valley counties of Texas live pink bollworm was found at rate of 1.6 per acre compared with 8.6 per acre for the previous year. Further up the coast in this state in Nueces and San Patricio counties where drought conditions were more severe inspections of debris thus far this year have shown an average of 251.9 live pink bollworms per acre compared with 9.2 in the winter of 1954–55. ▲

Spittlebug

An Illinois fall survey shows an increase in adult populations of the meadow spittlebug in the western and northwestern areas of the state and also in Iroquois, Champaign, Moultrie and Cumberland county areas.

Biggest gains were in the north and it is predicted that 60 per cent of all clover and alfalfa fields in the Stephenson, Ogle, Kane and McHenry counties area will require spring treatment. A narrow band extending from Whiteside county to Will county then north to Lake county and south into Iroquois county will probably have a moderate infestation where 10 per cent or more of the fields should be treated.

Plant Safety Tip #8

Acid Burns

The Accident: A 42 year old maintenance department employee, with the firm for 11 months, sustained burns on his face, arms and chest.

Cause: At about 9:30 in the morning, he tried to open an acid valve with a wrench. The pressure blew a plug out and acid spewed on the man as he was bent over the plug.

This valve had proven defective shortly before he attempted to open it and should have been replaced when found to be unsafe.

Action Taken: Thorough indoctrination was again given the men on procedures for handling valves.

Literature

Effective Communications on the Job. American Management Assn., 1515 Broadway, Times Square, NYC 36. 296 pages. $5.50 (AMA members, $4.50).

A handbook offering realistic solutions to communication problems of the industrial executive or supervisor. Using actual company materials, it includes chapters on employment interviews; job ratings; conference leadership; introducing the new employee; reprimands; giving orders; talking safety; handling rumors; and other subjects.

Soil Physics, 3rd edition. By Dr. L. D. Baver. John Wiley & Sons, Inc., 440 4th Ave., NYC 16. 489 pages. $7.75.

A considerable revision of earlier versions incorporating two new chapters on soil irrigation and drainage and added discussions on soil puddlability, chemical soil conditioners and recent contributions of the diffusion process in soil aeration. Also included is information on hydraulic conductivity, soil moisture stress and plant growth, the importance of compaction on soil tillage, and wind erosion processes.

Basic purpose of the book is to review fundamental and applied aspects of soil physics and to deal with practical problems as they relate to physical makeup and behavior of the soil.

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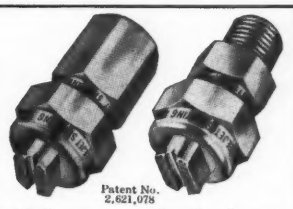
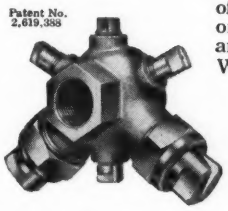


Patent No. 2,621,078

World famous nozzles for boom and portable sprayers. Choice of over 400 interchangeable orifice tips in flat spray, cone and straight stream types. Write for Catalog 30.



Patent No. 2,619,388

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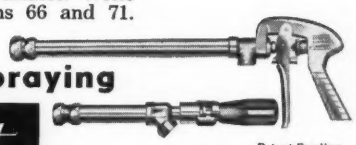
Spray up to 66 feet wide with one assembly. For spraying grains, grasses and liquid fertilizers. Write for Bulletins 66 and 71.



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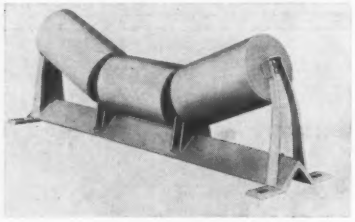
Equipment & Supplies

Economies with L-B Belt Idler Series

Savings in both initial cost and power requirements are reported by Link-Belt for its new Series 50 ball bearing belt conveyor idler. Two types are available, a greaseable unit with "one-shot" lubrication system serving all



three rolls at once and a factory sealed type which requires no further greasing.

Produced for seven belt widths from 14 to 36 inches, they consist of a smooth outer shell plus a heavy-wall steel center tube. The tubes are brazed to dish-shaped steel heads forming a strong, moisture-tight integral unit. For a folder with information on the complete line

Circle 99 on Service Card

Accessories Added To Towmotor Line

New accessories for Towmotor Corp. fork lift trucks includes an overhead guard attachment designed to provide maximum driver protection.

For mechanical unloading, a compact "pusher" device, the Unloader, helps place materials in warehouses, freight cars or trucks in minimum time. Controlled by hydraulic action, it pushes the load from the truck forks into its proper location. Other additions include a ram attachment and a carton clamp.

New High Speed H-R Vibrating Screen

A new high-speed vibrating screen from Hewitt-Robins is said to be 30 to 80 per cent faster than previous mechanical screens with a speed of 3300 rpm on 1/32" stroke and 2400 rpm on 1/16" stroke.

Designed to use with screen cloth of 10 to 80 openings per lineal inch it can, under some conditions, be used for separations high as 100 mesh. Wet or dry materials can be screened and the unit operated with electrically heated screen cloth.

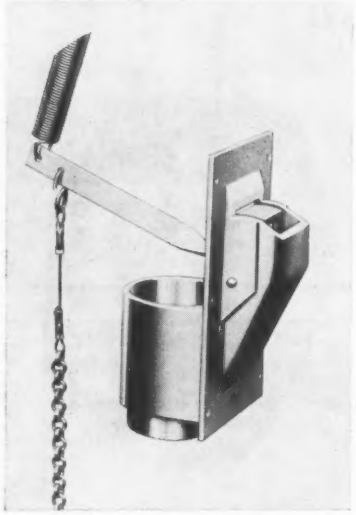
Less headroom is required than for previous models, and the screen handles most materials at an inclination from only 10 to 15 degrees. For information

Circle 100 on Service Card

Uniform Samples With New Device

Ralph C. Gardner & Co. reports that its new sampler device is filling a big need in a nearby fertilizer plant. It is designed to do away with spot checks, providing instead a uniform sample over an entire shipment.

A non-stretch aircraft cable is attached to the sampler operat-



ing arm and adjusted to the desired opening. A small duct delivers the sample to the collection point. The sampler can be closed by releasing the cable. For a descriptive sheet

Circle 101 on Service Card

Conveyor Loader By Power-Curve

Loading bags into cars and trucks is speeded with Power Curve Conveyor's power drive loader that can be propelled

through a curve or doorway on a radius as low as six feet. The conveying arrangement is a series of steel spring belts operating over grooved rollers that are hinged together.

As loading progresses the unit is withdrawn under power without disruption of bag flow. Capacity is 30 sacks per minute. For more information on this Power-Curve Conveyor loader

Circle 102 on Service Card

Enlarged Kardex-R-R Sched-U-Graph

Remington Rand now has an aluminum Sched-U-Graph, an enlargement of Kardex to display board size designed to show both planned and actual work through colored signals and operations cards.

Work planned and work done are shown in the same space in their relation to each other and in relation to time, and a change in scheduling means only an adjustment of cards and signals.

For a descriptive catalog (KD-777) write Remington Rand, 315 4th Ave., NYC 10 or an R-R sales office.

Fuller Mat. Level Indicator Improved

Fuller's Material-Level Indicator is now available for use with all dry, pulverized, crushed or granular materials. Exposed parts can be built of stainless steel for use with corrosives.

It may be mounted vertically or horizontally with a maximum paddle shaft extension of 10 to 12 ft. recommended for the vertical unit. When incoming material reaches the paddle wheel level, shaft movement is restrained. A

10-watt motor, located externally, revolves on its shaft until it contacts two micro switches which flash a signal to the operator or to feed supply. For more detailed information

Circle 103 on Service Card

Carpenter PVC Pipe

Two types of rigid unplasticized PVC (polyvinyl chloride) pipe with application in the farm chemicals industry now are being marketed by the Alloy Tube Div. of Carpenter Steel Co., a normal impact grade with high chemical resistance, and a high impact grade with slightly less chemical resistance but much greater strength.

Designated Carpenter PVC No. 1 and No. 2, respectively, both types are easily fabricated on standard metal and woodworking equipment, and installation is reported simple and inexpensive.

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Fertilizer Materials Market

New York

February 11, 1956

Sulfate of Ammonia. With a large tonnage recently earmarked to go to Korea, producers were in a slightly better position than they were 30 days ago. In certain other quarters, however, reports were current that some stocks were getting rather burdensome to the producers. No price changes were reported.

Ammonium Nitrate. One large producer was awarded a contract to supply some material for shipment to Korea. Demand was expected to pick up shortly with the approach of better weather.

Urea. With very little material arriving from abroad, the domestic producers had the market pretty much to themselves but most shipments were reported on the slow side. No price changes were noted.

Nitrogenous Tankage. While reports were current that some price shading was being done by certain producers in order to move material, this was denied in official quarters but the reports persisted. The market was quoted nominally at $4 to $4.50 ($4.86 to $5.47 per unit N), f.o.b. production points.

Castor Pomace. While some sales were reported at $40 per ton, f.o.b. production points, demand was rather limited at the present time although the producers showed no disposition to cut prices. A better demand is expected in the next 30 days.

Organics. Most markets were rather quiet in the organic fertilizer trade as most buyers waited to get a clearer picture of their requirements for the spring season. Tankage sold at $4 ($4.86 per unit N) and under, f.o.b. Eastern shipping points while blood last sold at $4.75 per unit f.o.b. New York.

Fish Meal. Because of recent heavy imports of fish meal, domestic material was unable to hold up in price and sales were made of menhaden fish meal at $138 per ton, f.o.b. fish factories, with some imported selling at even lower prices.

Bone Meal. The market for imported and domestic was quoted at about $65, f.o.b. shipping points, with demand fair. There were no offerings of raw bone meal available.

Hoof Meal. A routine affair in hoof meal was reported with last sales on the basis of $6.25 per unit of ammonia ($7.59 per unit N), f.o.b. Chicago for prompt shipment.

Superphosphate. Stocks were ample at all points and most producers were trying to get buyers to take delivery of amounts previously purchased.

Potash. Shipments were reported picking up in some areas while other sections reported a slow situation. Most buyers are waiting to see how much fertilizer they will be able to move in the next 60 days.

Feather Meal. Feed buyers have shown more interest in this material recently and the price has advanced from a low of about $4 per unit of ammonia ($4.86 per unit N), delivered Eastern points to $4.75 ($5.77 per unit N), delivered, with offerings restricted.

Philadelphia

February 10, 1956

There is still not much activity in the materials market. Prices are down in practically all organic departments, and inventories are large. Mixed fertilizer consumption during the past year has fallen considerably below the previous season. Present demand is not encouraging.

Sulfate of Ammonia. Production continues to increase, and while recent large export sales will materially reduce storage supplies, stocks on hand still remain quite large. No published price changes are indicated.

Nitrate of Ammonia. A slight improvement in demand is noted, but production continues ahead of last season and stocks are accumulating in spite of export business.

Nitrate of Soda. Interest is picking up and stocks are ample to meet all current requirements. Prices remain unchanged.

Blood, Tankage, Bone. Blood and tankage are weaker and more or less nominal at $4.75 per unit ammonia ($5.77 per unit N) for blood, and $4.50 per unit ($5.47 per unit N) for tankage. Bone meal is listed at $65 per ton, and nitrogenous tankage at $4 to $4.50 per unit ammonia ($4.86 to $5.47 per unit N).

Castor Pomace. Supply is limited, as is also the demand, with price placed at $40 per ton.

Fish Scrap. Demand is very poor and market weak. Scrap is quoted at $135 per ton, with meal at $140 per ton.

Phosphate Rock. Slight improvement is noted in domestic movement, with good demand for high grade rock. High ocean freight rates tend to limit export trading.

Superphosphate. Movement is slightly better, particularly in triple grade. Stocks of normal grade continue large. Prices are unchanged.

Potash. Slightly increased demand is noted and more definite improvement is looked for shortly —as spring mixing gets properly under way. ▲

Suppliers' Briefs

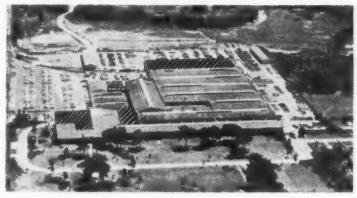
Chase Bag Co. Paul E. Nelson has been named sales manager at New Orleans, replacing J. A. Sutherlin, appointed manager of export sales.

The firm's executive vice president, R. N. Conners, has been re-elected president of the Textile Bag Mfrs. Assn.

Clark Equipment Co. has opened a materials handling development center at Battle Creek. Established to develop materials handling methods for individual industries, the center is equipped with both indoor and outdoor "proving grounds" and test areas. Space is available for small seminar groups as well as large-scale industry-wide sessions.

Fulton Bag & Cotton Mills elects new officers: R. O. Arhold, board chairman; Norman E., Clarence E. and Jason M. Elsas, divisional vice presidents; F. G. Barnet and E. M. Hornsby, vice presidents; and E. A. Cronheim, secretary and treasurer.

The Frank G. Hough Co. Construction of a 55,000 sq. ft. addition to its p ant is announced.



To be completed this year, the new buildings will add 368,000 sq. ft.

R. E. Zimmerman, new district representative, will cover New York State and Penna., excluding New York City and Philadelphia.

Union Bag & Paper Corp. territorial changes: C. M. Campbell to Minneapolis, F. M. Whittaker to Chicago, and A. J. Sohmer to Baltimore.

Statistics

Super Production Gains in November

Production of 216,247 tons (100 per cent APA) of superphosphate during November was an increase of 1 per cent from October and was 12 per cent higher than the 1954 month.

Shipments also gained; the total of 135,294 tons was up six and 20 per cent respectively. At the end of November, stocks on hand were 13 per cent more than those held on November 30, 1954 and 5 per cent greater than quantities held on October 31, 1955.

New Monthly High For H_2SO_4 Output

In November, sulfuric acid was among the four chem cals for which the Bureau of the Census reported new monthly production highs.

Production — November, 1955

Compiled from Government Sources

Chemical	Unit	November 1955	November 1954	October 1955
Ammonia, synth. anhydrous	s. tons	[1]268,054	238,463	*265,868
Ammonia liquor, coal & coke (NH_3 content) (Including diamm. phosphate & ammon. thiocyanate)	pounds	4,178,738	3,172,200	4,253,262
Ammonium nitrate, fert. grade (100% NH_4NO_3)	s. tons	153,595	156,561	149,723
Ammonium sulfate				
synthetic (technical)	s. tons	92,085	78,738	93,069
coke oven by-product	pounds	160,723,489	145,659,500	164,709,836
BHC (Hexachlorocyclohexane)	pounds	3,477,570	2,035,910	3,700,511
Gamma content	pounds	628,392	320,906	846,355
Copper sulfate (gross)	s. tons	6,748	4,476	7,420
DDT	pounds	10,310,389	6,459,354	10,273,183
2,4-D Acid	pounds	2,932,820	———	3,154,268
esters and salts	pounds	2,530,132	1,002,759	2,006,223
esters and salts (acid equiv.)	pounds	1,819,501	818,882	1,628,446
Phosphoric acid (50% H_3PO_4)	s. tons	298,313	257,550	320,269
Sulfur, Native (Frasch)	l. tons	537,461	467,098	545,159
Recovered	l. tons	35,000	29,400	36,100
Sulfuric acid, gross (100% H_2SO_4)	s. tons	1,417,145	1,254,778	1,354,538
Chamber Process (100% H_2SO_4)	s. tons	210,807	221,303	190,636
Contact Process (100% H_2SO_4)	s. tons	1,206,338	1,033,475	1,163,902
Superphosphate (100% APA)	s. tons	216,247	192,554	214,898
Normal (100% APA)	s. tons	147,325	136,926	141,357
Enriched (100% APA)	s. tons	1,953	3,597	1,661
Concentrated (100% APA)	s. tons	66,025	50,896	71,126
Wet Base (100% APA)	s. tons	944	1,135	754

* Revised. [1] Includes quantities for 1 plant previously not reporting.

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Bushy Park, S.C.— Sites for Industry

IN JULY, a freak of geography and completion of an engineering miracle will give industry a huge reservoir of fresh soft water adjacent to plant sites directly on the ship channel in South Carolina's Bushy Park area of Berkeley county, adjoining Charleston.

An engineering scheme devised by Arthur M. Field and pushed into reality by Charleston's Mayor William McG. Morrison will utilize daily discharge of 10 billion gallons of fresh water discharged from the Santee-Cooper hydroelectric plant 40 miles upstream. This water will be diverted through a canal into Back river and the river closed by an earth-fill dam. The dam will not only block salt water intrusion but will carry a railroad spur and highway.

The transformation will make Bushy Park, named after an old plantation, the world's largest supply of industrial fresh water and will provide plant sites on a 35 foot deep ship channel. Another geographic break is proximity of the Cooper river, offering perfect effluent disposal without expensive treatment.

Cost of the project, estimated at $4.5 million, is astonishingly low when compared to $800 million for the Delaware river Icodel project, adding but one and a half billion gallons a day to New York, New Jersey and Pennsylvania water supplies.

Mayor Morrison was named chairman, in 1953, of an Authority to administer the project, and under his guidance the Charleston city council approved a $1 million bond guarantee in 1954. The Authority was scheduled to issue long-term revenue bonds for the remaining $3.5 million.

Efforts are now turned toward getting industries particularly suited to Charleston's advantages and, says the city development board, big water-using concerns have already expressed a keen interest. ▲

STEDMAN FERTILIZER PLANT EQUIPMENT

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editorial

SOME of the many fallacies often involved in product pricing were discussed at a recent AMA conference by Dr. Alfred R. Oxenfeld of Boni, Watkins, Mounteer & Co., Inc. Big weaknesses, said Oxenfeld, are failures to develop a consistent market strategy aimed at a particular group, outmoded company policies, mistaken objectives and neglect of price reviews on a regular basis.

Other concepts much used but contrary to sound policy include: Basing price only on cost, allowing but slight deviation; setting prices independently of advertising, distribution and sales decisions; a mechanical formula will give the most profitable price; efforts should be based on winning customers in shifts of market share; demand depends on customer action, not the action of competitors; price cuts will win customers, not force rivals to match your cuts; some customers can be charged more than others requiring similar service costs; prices should be lowered because sales are falling off; and price is determined by supply and demand, but prices can be set on cost alone, ignoring demand.

Dr. Oxenfeld offered this checklist of data that should be in your hands before a price is set.

Information on demand. How are your customers' purchases likely to be influenced by price changes? How will purchases of ultimate consumers be affected by changes in prices charged them? How are your customers' prices influenced by what you charge? How about your rivals, current prices? When do they change price? Where do special demand conditions exist?

What is the outlook for new products or product improvement in spheres close to yours? Is it likely that new rivals will enter the market? What kind of customers are you losing and why? What kind are you gaining and why? With which rivals are their customers growing most dissatisfied and why?

Information about cost. How are average and "incremental" costs influenced by volume of production? Differences of cost in serving different classes of customers? How great are distribution costs on the average by types and sizes of customers? How much and what kind of information can you afford to collect?

When competitors cut prices, Oxenfeld warned, don't follow blindly—stop to diagnose the cause. If it is a temporary, unstoppable thing, try to avoid following suit, but if it appears to represent the decision of a responsible company that the market would expand substantially through a price cut, then you will probably have to meet the drop if not welcome it.

Regardless of the technique or procedure used in determining price, he emphasized, a healthy respect for sound judgment should be maintained. Pricing has not yet been reduced to the stage where a rigid step-by-step procedure is the only requirement.

GORDON B. NANCE, Missouri extension economist, points to the "mental blind spot" that prevents large numbers of fertilizer users from obtaining maximum profits with plant foods. They just don't realize the percentage returns.

He declares that fertilizer pays these dividends at a rate far exceeding that of most popular business investments but that only a portion of this pay-off is ever realized at present.

One experiment cited by Nance showed that $40.00 worth of fertilizer per acre had to be used on below average corn belt land before the returns from the last addition declined to 5 per cent, still a reasonable dividend.

Sooner or later, he emphasized, our farmers will use plant foods just as businessmen utilize their production resources, applying the materials "up to the amount that the last increment returns only its cost plus the going interest rate."

"Then", Nance continued, "fertilizer use will be perhaps six to 10 times the piddling little 30 to 40 pounds now used on the average acre of cropland and pasture in the United States and the 50 to 60 pounds used in Missouri."

When will usage reach a level six to 10 times our current consumption? Nance, of course, doesn't look for overnight miracles but does believe that during the next decade, usage increases will be two to three times as rapid as in the past 10 years.

G. P. T., JR.
Editor

Buyers' Guide

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ALDRIN
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Shell Chemical Co., Agr. Chem. Div., Denver, Colo.

AMMONIA—Anhydrous and Liquor
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Ketona Chem. Corp., Ketona, Ala.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sohio Chemical Co., Lima, O.

AMMONIA CONVERTER
J. C. Carlile, Corp., Denver, Colo.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Co., El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Atkins, Kroll & Co., San Francisco, Calif.

BAGS—BURLAP
Chase Bag Co., Chicago, Ill.

BAGS—COTTON
Chase Bag Co., Chicago, Ill.

BAGS—Multiwall-Paper
Chase Bag Co., Chicago, Ill.
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Kraft Bag Corporation, New York City
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BAGS—Dealers and Brokers
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BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

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Woodward & Dickerson, Inc., Philadelphia, Pa.

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American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

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McIver & Son, Alex. M., Charleston, S. C.
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Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

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National Lime & Stone Co., Findlay, Ohio

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DDT
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ENGINEERS—Chemical and Industrial
Stedman Foundry and Machine Co., Aurora, Ind.
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FERTILIZER—Liquid
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FERTILIZER—Mixed
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
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Poulsen Co., Los Angeles, Calif
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
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Power-Curve Conveyor Co., Denver, Colo.
Stedman Foundry and Machine Co., Aurora, Ind.
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Sturtevant Mill Co., Boston, Mass.
Tractomotive Corp., Deerfield, Ill.

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Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

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Poulsen Co., Los Angeles, Calif.
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MANGANESE SULFATE
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MANURE SALTS
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International Min. & Chem. Corp., Chicago, Ill.
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Escambia Bay Chem. Corp., Pensacola, Fla.
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Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sohio Chemical Co., Lima, O.

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Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
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Smith Rowland Co., Norfolk, Va.
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Ashcraft-Wilkinson Co., Atlanta, Ga.
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International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
National Potash Co., N. Y. C.
Potash Co. of America, Washington, D. C.
United States Potash Co., N. Y. C.

POTASH—Sulfate
American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS
Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.

SEPARATORS, AIR
Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.

SHOVEL LOADERS
Clark Equipt. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.
Tractomotive Corp., Deerfield, Ill.

SOILTEST EQUIPMENT
The Edwards Laboratory, Norwalk, O.

SOLVENTS
Crowley Tar Products Co., New York City
Richfield Oil Corp., Los Angeles, Calif.

SPRAYERS
Finco, Inc., N. Aurora, Ill.

SPRAYS
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.
Baughman Mfg. Co., Jerseyville, Ill.

SPREADERS, TRUCK
Baughman Manufacturing Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

STORAGE BUILDINGS
Butler Manufacturing Co., Kansas City, Mo.

STORAGE TANKS
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Min. & Chem. Corp., Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D. Manufacturing Co., Newnan, Ga.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr., Chem. Div., Pittsburgh, Pa.

TRUCKS—SPREADER
Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS
Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C
Sohio Chemical Co., Lima, O.

UREA-FORM
Nitro-Form Agricultural Chemicals, Woonsocket, R. I.

VALVES
Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.

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